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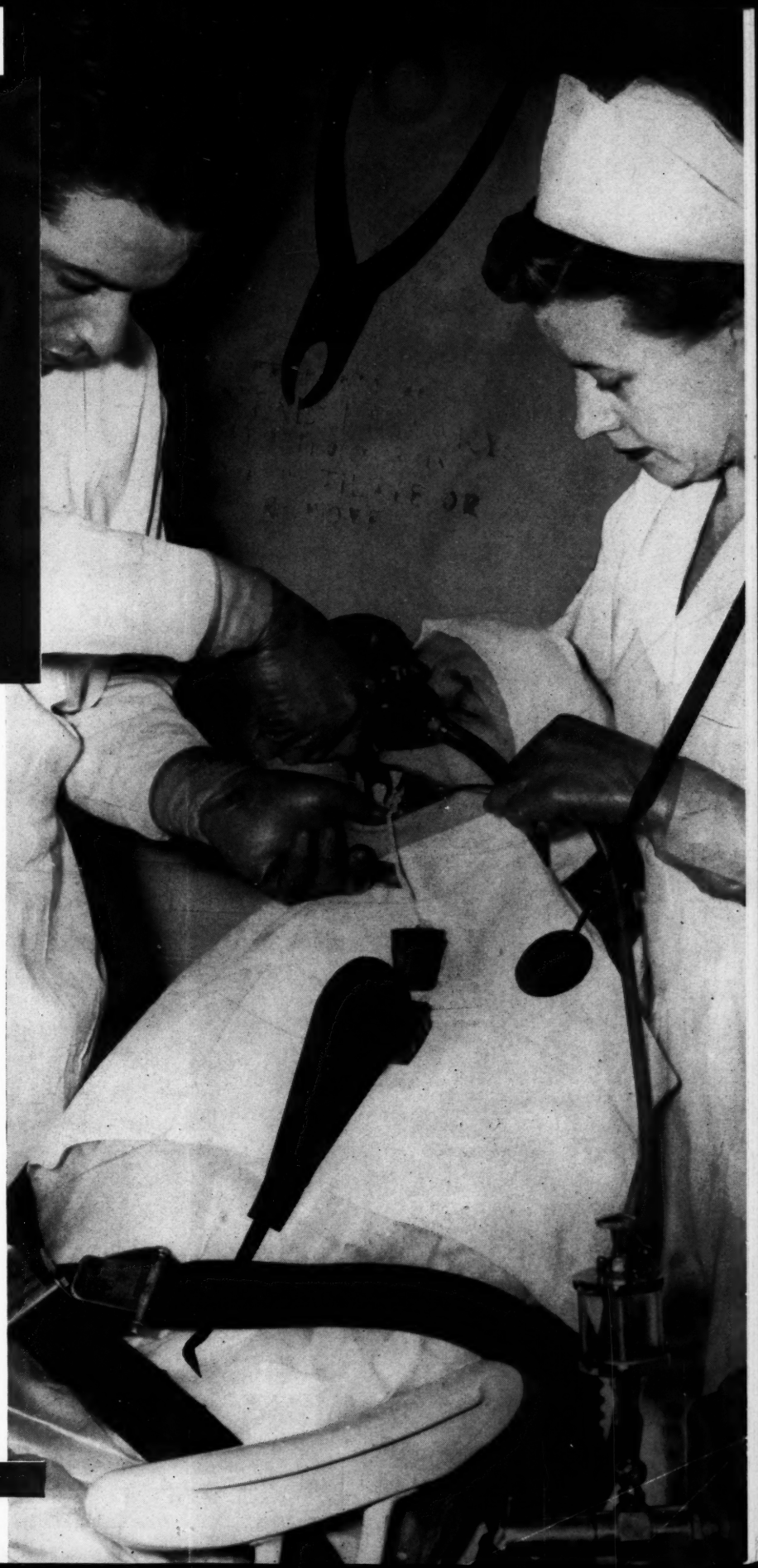

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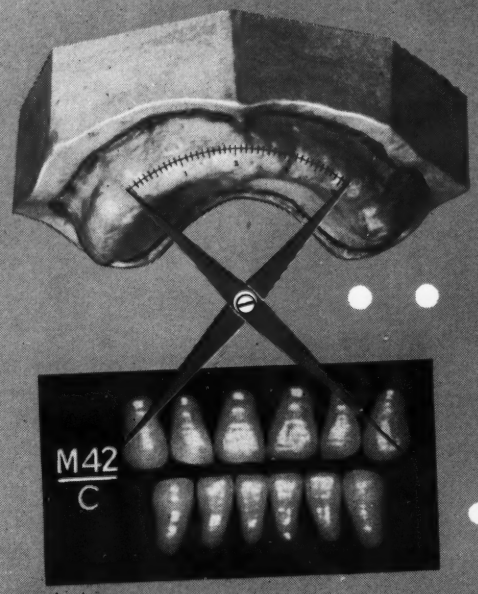

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SHORT S		S39 C S39 F	S40 C S40 F	S42 C S42 F	S43 C S43 F	S45 C S45 F	S46 C S46 F	S48 C S48 F	

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Vol. 56, No. 9

Dental Digest

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About Our CONTRIBUTORS

Louis Willinger, D.D.S. (New York University, College of Dentistry, 1922) emphasizes in his practice exodontia and oral surgery and has published widely on dental anesthesia and related subjects. Doctor Willinger's article, Procedures for General Anesthesia in the Dental Office, in the present issue is his first to appear in Dental Digest.

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Henry I. Meyer, D.D.S. (New York University, College of Dentistry, 1932) who published an article in Digest in March 1950, Pressure Matrixes for Acrylic, presents in this issue Matrix Retention in Class III and Class IV Acrylic Restorations which describes a method for overcoming some of the imperfections existing in the technique as originally detailed.

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Procedures for GENERAL ANESTHESIA *in the Dental Office*

LOUIS WILLINGER, D.D.S., New York City

DIGEST

Because of nervous disturbances many patients have an exaggerated sense of fear and stay away from the dental office until an emergency arises. In an attempt to escape from real or imaginary painful traumatizations, patients frequently insist that a general anesthetic be administered for any operative procedure.

For the same reason there has been a notable increase in the general use of drugs which have an anodyne, sedative, or hypnotic effect.

Dentists recognize these facts and are increasingly interested in general anesthesia which can be applied in the dental office. Most dental courses in the subject are rather limited, however, and dentists seeking training in general anesthesia often go to the manufacturers of anesthetic gases and apparatus for study instead of to accredited schools or hospitals.

Considerations in the Use of a General Anesthetic

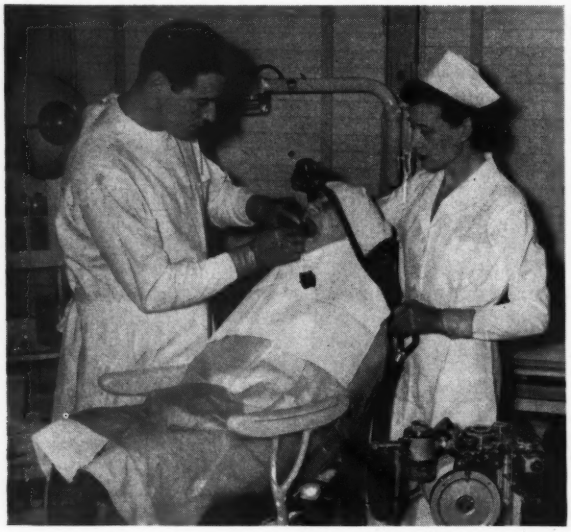
Some of the essential factors to be considered by the anesthetist are the following:

1. Dental office patients are ambulatory. Recovery from anesthesia must be rapid to enable them to go home within a reasonably short period of time.

2. Nitrous oxide-oxygen is a comparatively weak agent with an extremely narrow anesthetic threshold. It is frequently described, therefore, as a tight-rope anesthetic, requiring a highly developed technique for maintaining a safe and correct anesthetic balance.

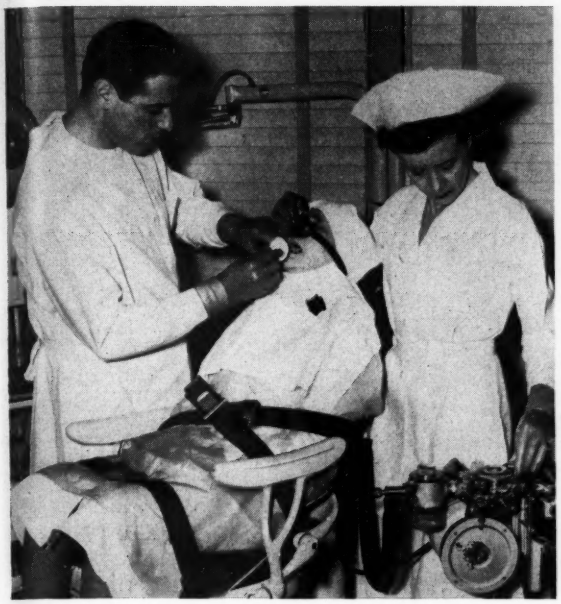
3. Although some dentists attempt to combine the services of operator and anesthetist, because of the difficulties encountered, it is considered impossible.

4. A general anesthetic must be so balanced as to provide a minimum of disturbance in the body metabolism with a maximum of safety. Shortly after completion of an operative procedure the patient should be virtually free from postoperative anesthetic effects.

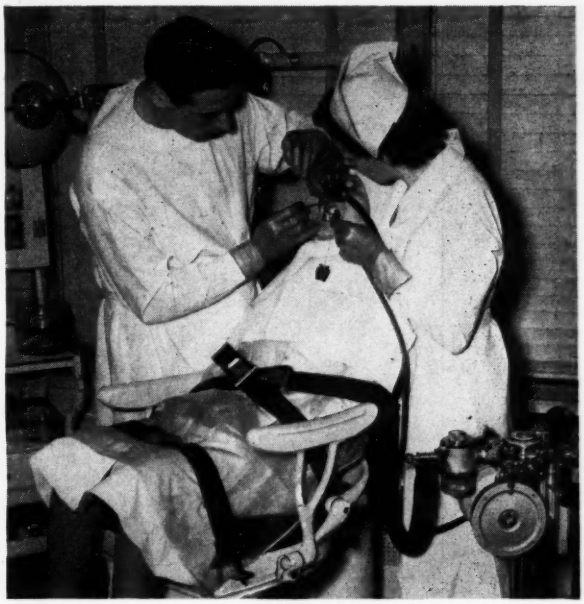


1. *Patient seated in dental chair tilted at a 30-degree angle. The mouth prop is being placed in position. The assistant is adjusting the nosepiece. The rubber tubing leading to the nosepiece is placed inside of headrest.*

2. *Assistant is holding nose and mouthpiece in position with right hand. She is administering gases with left hand. Restraints which are bolted to chair have been tightened. Operator is watching the anesthetic procedure.*



3. *Anesthesia is established. Nurse is holding down nosepiece with right hand. The left hand is used to manipulate dials. Operator places throat curtain in position.*



4. *Operator retracts lip and starts surgery. Nurse holds nosepiece in position with right hand. The aspirator is held with the left hand.*

5. *Surgery has been completed. Operator raises patient's chin. Nurse is administering 100 per cent oxygen.*

6. *Operator is raising chin with left hand to ensure an open airway. Restraints unfastened. Right hand on abdomen. Nurse is administering 100 per cent oxygen.*

5. A careful diagnosis and an estimate of the time required for the completion of the operation should be made.

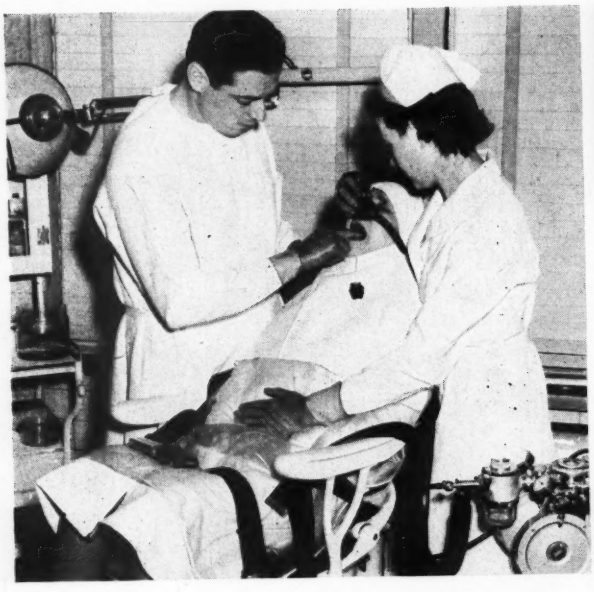
6. The employment of a tested, definite, and accepted technique will greatly facilitate the administration of a general anesthetic.

7. The anesthetic apparatus and all its appurtenances, such as pressure valves, and rubber attachments must be in perfect functioning order.

8. A detailed knowledge of available anesthetic agents is necessary.

7. *Wrong technique. Operator depresses mandible. This should be avoided.*

8. *A wooden wedge is used to pry jaws apart when prop is inadvertently dislodged.*



9. *Distressed respiration is corrected by downward pressure on tongue and rhythmic pressure on lower abdomen after restraints have been unfastened. 100 per cent oxygen is used.*

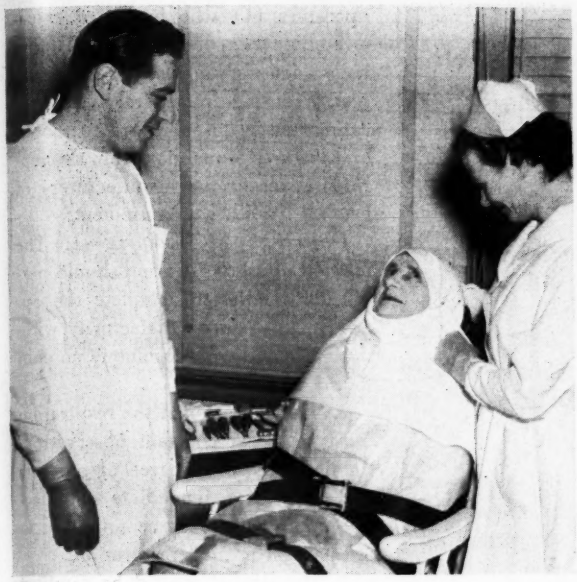
10. *Distressed respiration is being corrected by gently pushing mandible forward.*

Managing the Difficult Patient

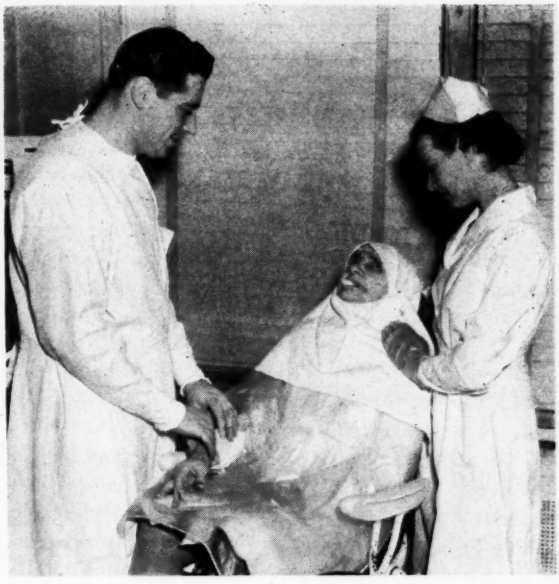
Problems—1. Inexperience, resulting in the inability to recognize or differentiate symptoms of anesthesia, are the cause of most failures in nitrous oxide-oxygen anesthesia. Most authorities divide anesthesia into a number of stages, based on signs and physical manifestations but in practice the stages are seldom clearly defined.

2. Violent muscular activity during the so-called second stage of anesthesia has always been a source of trouble to the student anesthetist.

The Resistant Patient—1. The inexperienced operator finds it difficult to anticipate with any degree of accuracy which type of patient will offer resistance or be obstreperous.



11. *Patient recovering from anesthesia. Restraints in position.*



12. *Patient fully recovered. Gauze tampon in position.*

2. When a resistant patient enters a dental office for the removal of a tooth or any other operative procedure and general anesthesia is indicated, a potential problem is easily recognized.

3. If the dentist follows his customary procedure with a resistant patient the operation is completed with difficulty.

Satisfactory Anesthesia—(1) Out of door workers, (2) vigorous, athletic patients, and (3) the alcoholic patient can be safely anesthetized with an anesthetic mixture delivered under slightly greater pressure than that required for the average patient. Under slightly increased pressure, the tissues become sufficiently saturated with the anesthetic drugs and within two to four minutes the patient loses consciousness.

The Addition of Oxygen—A quantity of not less than 10 per cent oxygen must be added to the nitrous oxide from the start. It is a mistake to believe that the resistant patient can be anesthetized more easily with 100 per cent nitrous oxide. On the contrary, nitrous oxide administered without oxygen induces a state of anoxia more quickly, increasing risk. Greater pressure and the absolute prevention of air inhalation will be found efficacious.

Distressed Respiration

1. Distressed respiration should be recognized and should be corrected instantly. Any interference with normal breathing should be eliminated.[1]

2. An important consideration often overlooked is the fact that during the maintenance period the percentage of oxygen in the mixture must be increased as rapidly as possible without disturbing the plane of anesthesia.

3. The safety of any method of administering general anesthesia is measured in terms of the ability and experience of the anesthetist rather than by the potency of the anesthetic agent employed.

4. A weak anesthetic drug can be a dangerous weapon in the hands of the inexperienced operator while a skillful anesthetist can maintain a wide margin of safety using a potent agent.

Causes—The need for maintaining a clear airway is emphasized. An obstructed airway is usually the cause of distressed respiration. During the removal of lower teeth, pressure may inadvertently be placed upon the mandible forcing it downward and backward, causing interference with breathing.

Anoxia—If normal breathing is not quickly restored, a state of anoxia with the typical symptoms of jactitation, mild convulsion, and ashen gray color ensues. This may be followed by a complete loss of muscular activity and possible death. The patient should never be permitted to enter this precarious state.

Hypoxia—A state characterized by symptoms resulting from insufficient oxygen is indication for the immediate use of remedial measures. The symptoms of hypoxia are easily reversed by the addition of oxygen. This may not be true in a state of anoxia.

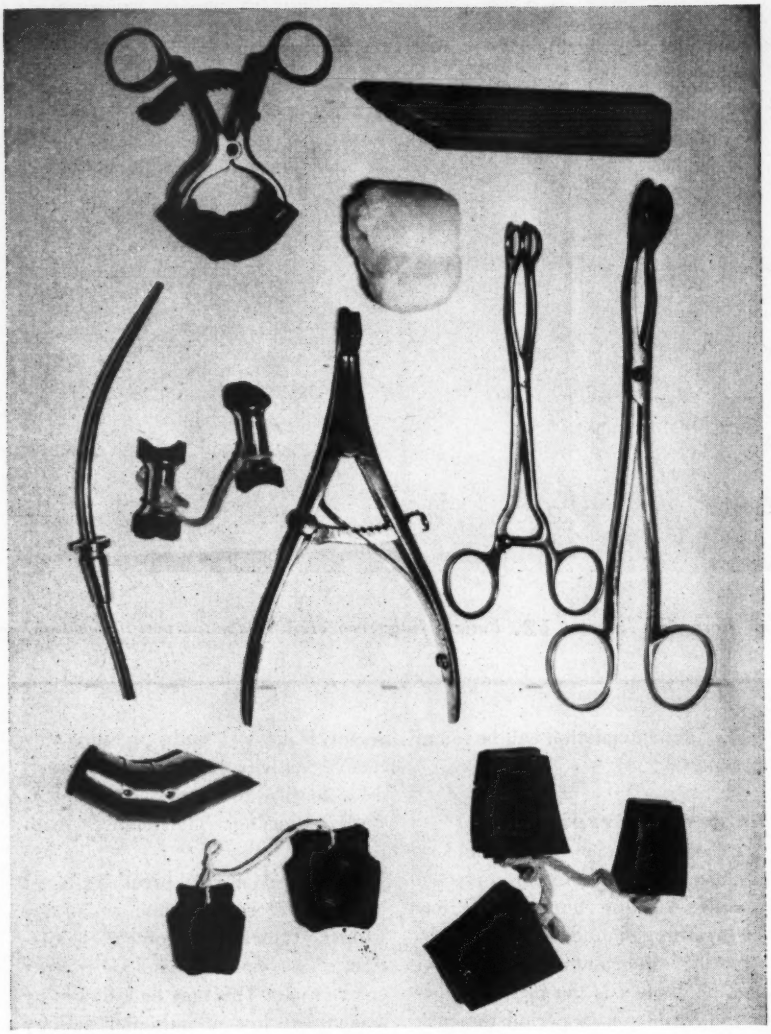
Indication—1. Close scrutiny of breathing will reveal more of the progress of the anesthesia than any one, or combination of, symptoms.

2. It is axiomatic that "as the respiration goes, so goes the anesthesia."

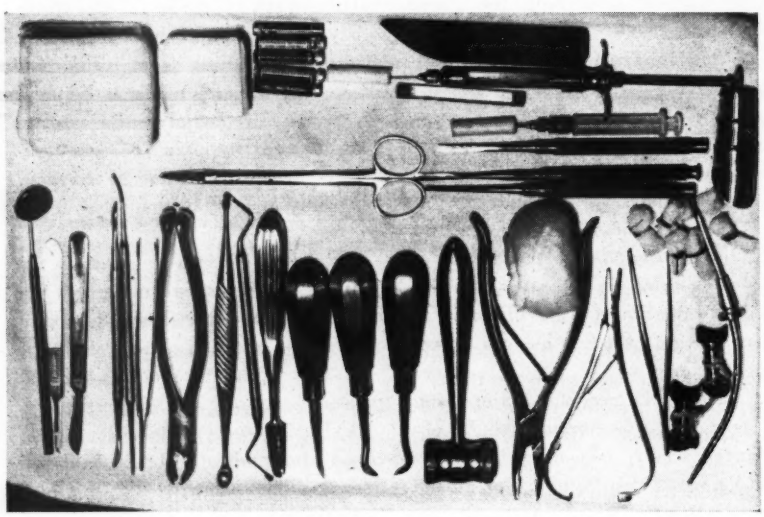
3. During surgery the color of the blood often indicates the necessity of adding more oxygen to the mixture.

Instruction in the administration of general anesthesia must be given by

[1]Everson, Stewart: Pentothal Sodium, Dental Items of Interest **70**:655-661 (July) 1948.



13. *Armamentarium for anesthesia.*



14. *Armamentarium for exodontia and oral surgery set on tray in back of chair.*

operators (1) who have had extensive clinical experience, and (2) who have scientific knowledge of the subject. Training in general anesthesia cannot be acquired from textbooks and lectures alone, nor from the representatives of the manufacturers of general anesthesia equipment.[2]

Objectives of Training—1. The method of administration should permit the dentist to complete the operative procedure satisfactorily without haste and with absolutely no pain to the patient.

2. The character of the respiration must be under constant observation. Should a marked degree of narcosis become evident, immediate and effective treatment should be employed to re-establish normal respiration.

3. The dentist should be familiar with all signs of distress or cessation of respiration and should have within easy reach the instruments and medicaments necessary to relieve the condition.

Premedication—If possible, premedication should be avoided because of the greater degree of safety with the unpremedicated ambulatory patient. (1) The action of most of the premedicating drugs, and (2) the behavior of the premedicated patient are somewhat unpredictable and the drugs may not act quickly enough to produce desired results.[3] The relaxation necessary for induction of anesthesia can frequently be obtained by reassuring the patient with a few kind words and suggestions. Extremely nervous patients require premedication.

Suggestions for the Beginner

1.The patient should receive at all times the maximum quantity of oxygen consistent with physiologic requirements. Frequently, as much as 40 to 70 per cent oxygen is needed to maintain a smooth and safe state of narcosis. (1) Shades of facial color, (2) change of pulse rhythm or respiration, (3) fall or rise of blood pressure, (4) abnormal muscular be-

[2]Eversole, U. H.: Anesthesia for Surgery About the Head, J.A.M.A. **117**:1760-1764 (November 22) 1941.
[3]Willinger, Louis: Synergetic Action of Nitrous-Oxide-Oxygen and Vinethene, *Oral Hygiene* **37**:1910 (November) 1947.

havior, or (5) signs of impending shock call for special treatment or a modification of the technique.

2. At no time should members of the family be present during the administration of a general anesthetic.

3. If the patient manifests an excessive fear of general anesthesia, undue persuasion should be avoided.

4. The patient must not be left alone until recovery is complete.

5. A clean, neatly appointed office, with the operating room at a distance from the reception room is desirable. It is impossible to anticipate when a patient may become obstreperous during anesthesia. Noises reaching the reception room will have an adverse effect on waiting patients.

Medical History Essential—The anesthetist may obtain clues regarding the selection, indications, and contraindications for the use of a general anesthetic agent from a medical history. Such information might indicate the need for a change in the technique of administration.[4]

Care in Operative Procedures Necessary—The use of general anesthesia should never be the excuse for hasty, incomplete, or careless surgery. The successfully completed operation is of prime importance. If, for some reason, general anesthesia does not permit the completion of an operation, a supplementary injection of procaine is considered good practice.[5]

Recovery Room Essential—While most patients recover quickly and are able to leave the office within ten to fifteen minutes, occasionally a patient may require one-half to three-quarters of an hour before recovering sufficiently to make a safe departure for home.

Preliminary Measures—1. Before administering general anesthesia the patient should visit the toilet. Involuntary defecation or micturation is embarrassing and all possible measures should be taken to prevent it.

2. Everything possible should be done to aid the patient to relax mentally and physically. It is difficult to obtain satisfactory anesthesia in a tense, apprehensive patient. These patients should be premedicated.

3. All suggestions to the patient should be clear, precise, and logical; they should be acceptable to the patient and within his capacity to perform.

4. A throat curtain (throat pack) must be placed in position when anesthesia is established and before beginning surgery. This helps to maintain the concentration of the anesthetic mixture and also minimizes the danger of aspirating a foreign object.[7]

Quiet Surroundings Important—1. During the induction period the patient is easily disturbed; therefore, it is best to minimize conversation and other noises.

2. Following a general anesthetic the patient should be allowed to recover in a suitable rest room and if possible, not be permitted to enter the reception room.

The Use of Safety Straps—1. The dental chair used for general anesthesia should be equipped with restraining straps. Safety belts (manufactured by Air Associates, Inc., Teterboro, N.J.) will be found adequate.[6]

2. All essential anesthetic and operative instruments must be arranged within easy reach so that it will not be necessary to waste time in searching for them while the patient is unconscious.

3. A dental nurse or assistant must be present at all times.

Additional Considerations

1. The maximum amount of oxygen that the patient will tolerate without producing too light an anesthesia should be employed.

2. Satisfactory rhythmic respiration must at all times be clearly evident during anesthesia. Exceptions, however, do exist and should be taken into consideration.

3. The addition of a synergetic agent, vinethene, neurolene (trichlorethylene and ether mixture) or ethyl chloride, added to the nitrous oxide-oxygen mixture greatly simplifies the administration of a general anesthetic. Administering a sufficient quantity of oxygen to meet the patient's requirement increases safety and contributes to the dentist's confidence so that he will be inclined to use general anesthesia more frequently in his routine practice. The synergetic agent, or agents, are placed in a special vaporizer which can be attached to the McKesson or Heidbrink apparatus.

Conclusions

1. Exodontia and minor oral surgery can be completed satisfactorily in the dental office in a comparatively light plane of anesthesia.

2. Insufficient oxygen will produce hypoxia (a state characterized by warning symptoms pointing to a lack of oxygen.) If these symptoms are not reversed, anoxia (a condition akin to asphyxia) with all its accompanying dangers, will ensue.

3. Sufficient oxygenation with rhythmic, unhampered breathing is desired and should be maintained during anesthesia.

355 *East 149th Street.*

[4]Guedel, A. E.: Inhalation Anaesthesia, New York, The Macmillan Company, 1937, p. 66.
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[8]Arrowood, J.: General Anaesthesia in Dentistry and Oral Surgery, Am. Journal of Orthodontics **29**:652 (December) 1943.

PENICILLIN SODIUM CAPPING

of Vital Cariously Exposed Pulps in Adults

AUSTIN H. KUTSCHER, B.A., D.D.S., New York

DIGEST

Crystalline penicillin is suggested here as an aid in the conservation of vitality and the preservation in the mouth of vital teeth having cariously exposed pulps. A different and improved pulp-capping technique is presented, the use of which is preferred, where possible, to pulpotomy and root canal therapy.

Penicillin Therapy in Dentistry

1. Oral sepsis involving many of the common oral bacteria has been treated successfully with penicillin administered by various routes.[1]

2. Penicillin has been used effectively in (1) oral surgery,[2, 3] (2) periodontia,[4] (3) endodontia,[5, 6, 7] and (4) in infections of the mouth such as Vincent's infection,[8] and gingival disease.[9]

The Role of Bacteriology

Bibby[10] reported that in addition to lactobacilli, a high percentage of the microorganisms found in tooth cavities were cocci, mainly streptococci. It is Bibby's opinion that "although any organism which will produce acid in the mouth is a potential cause of tooth decalcification . . . in the present state of our knowledge, all that can be said is that the association between particular bacterial types and dental caries suggests that either lactobacilli or streptococci may be causative agents . . . Since streptococci are present in such large numbers, grow so rapidly, and are so active in bringing about chemical effects, their role automatically becomes more important."

Bacteria Susceptible to Penicillin—1. Streptococci and lactobacilli are two microorganisms implicated generally in dental caries.[11, 12, 13]

2. Gram positive cocci and streptococci are known to be susceptible to penicillin.[14]

3. Staphylococci, streptococcic, and many other infections caused by gram positive cocci are conditions in which penicillin therapy is preferred.[15]

4. The lactobacillus also has been found sensitive to penicillin.[16, 17]

5. Rosen[5] and others have found penicillin effective against all the microorganisms within infected teeth which require periapical pulp canal therapy (elimination of infection within the periapical and pulpal area of a tooth).

6. The growth, therefore, of the bacteria most prevalent in (A) dental caries, (B) diseased pulp chambers, and (C) infected canals, and consequently those most likely to infect the pulp on contact, may be inhibited by penicillin.

7. Penicillin in effective concentrations may be bactericidal to microorganisms when it is in direct contact with them. In wounds penicillin is considered both bacteriostatic and bactericidal.[14]

Materials Used for Capping

1. In the past, many materials and medicaments have been used reluctantly to cap *surgically* exposed vital pulps.

2. These medicaments have been used even more hesitantly to cap vital but *cariously* exposed pulps.

3. The agents used have included the following: (1) fibrin, (2) zinc oxide-eugenol, (3) thymol, (4) metallic sheets, (5) asbestos, (6) calcium hydroxide paste, (7) zinc oxyphosphate cement, (8) phenol, (9) copper cement and others.

Previous Reults of Pulp Capping—Previous results have varied with the technique employed and the individual operator in both research and private practice. The data, however, indicated that further investigation might produce more uniformly successful therapy.

Combination of Medicaments Suggested—The use of a zinc oxide-eugenol paste as (1) a pulp sedative, (2) temporary stopping, and (3) pulp capping material is well known. The combination of zinc oxide-eugenol

[1]Goldman, H. M., and Guralnick, W. C.: Some Uses of Penicillin in Dentistry, Oral Surg., Oral Med., & Oral Path. **1**:116-128 (January) 1948.
[2]Harris, S. C.: Use of Chemotherapeutic Agents in Oral Surgery, Fortnightly Review, Chicago D. Soc. **15**:9-11 (May 1) 1948.
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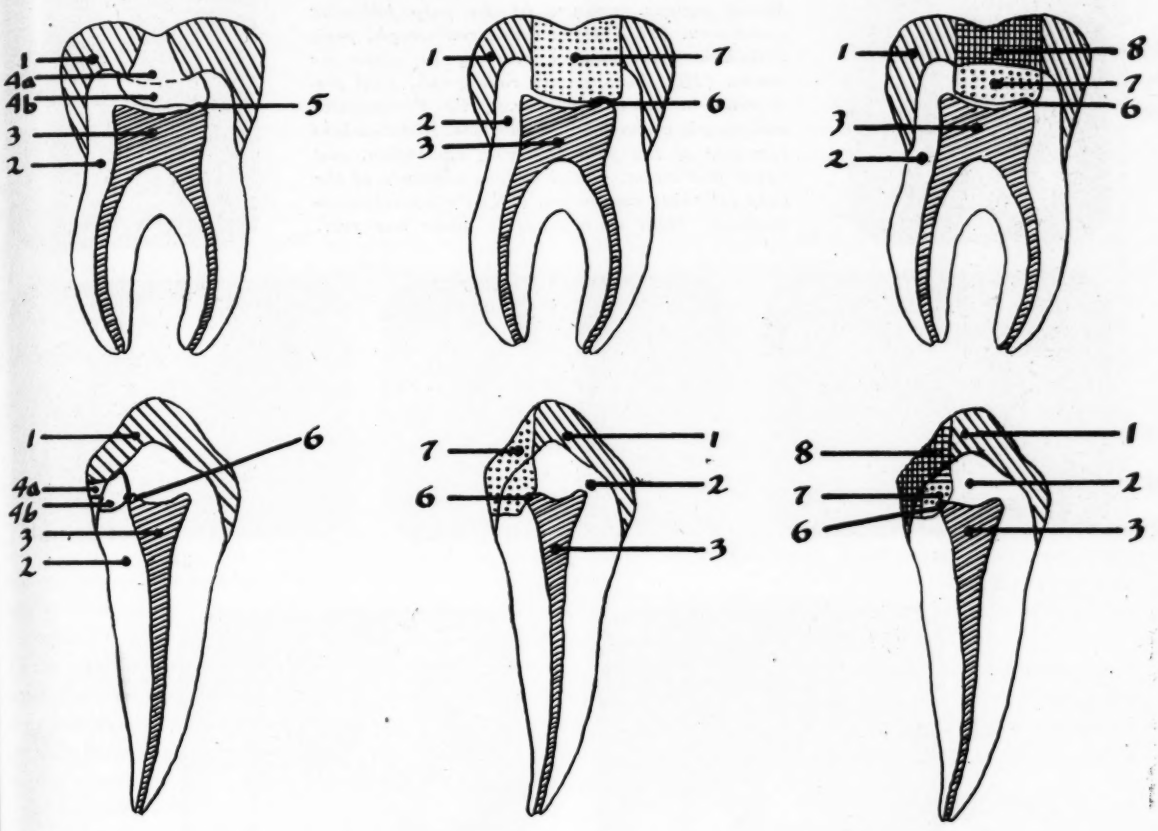
[17]Hill, T. J., and Kniesner, A. H.: Penicillin Dentifrice and Dental Caries Experience in Children, J. D. Res. **28**:263-266 (June) 1949.

Unexcavated Carious Adult Teeth | *Excavation Complete Penicillin and Penicillin-Zinc Oxide-Eugenol in Place* | *Final Restoration in Place*



1. Enamel
2. Dentine
3. Pulp
4. Caries (A. Enamel, B. Dentine)
5. Pulp exposure
6. Penicillin layered over pulp exposure
7. Penicillin-zinc oxide-eugenol cement
8. Permanent restoration

I. *Schematic diagram of penicillin-zinc oxide-eugenol pulp-capping technique.*

with penicillin suggested itself as a pulp capping agent with positive sedative and antibiotic properties.

The Antibiotic Action of Penicillin-Zinc Oxide-Eugenol Dressing

1. Bartels[18] demonstrated marked bacteriostatic action of eugenol on microorganisms in vitro.

2. Bartels[19] further experimented in vitro with staphylococcus aureus microorganisms, using the drugs sodium penicillin, zinc oxide, and eugenol.

3. These drugs were tested alone and in various combinations.

Methods of Use—Pellets or points of the agents soaked with the medicaments were placed in Petri dishes filled with agar inoculated with the bacteria. The radius of growth inhibition in the agar about the pellet was measured following incubation.

Experimental Antibiotic Activity—1. Zinc oxide alone, dry or moist, did not inhibit the growth of microorganisms about it.

2. Zinc oxide and eugenol paste inhibited bacterial growth for 6 millimeters about the pellet.

3. Eugenol alone inhibited growth for 6 millimeters about the pellet.

4. Sodium penicillin inhibited growth for 23 millimeters about the pellet.

5. Zinc oxide-eugenol and sodium penicillin paste inhibited growth for 18 millimeters about the pellet.

It is evident that the efficiency of penicillin is decreased only slightly by the addition of the sedative zinc oxide-eugenol.

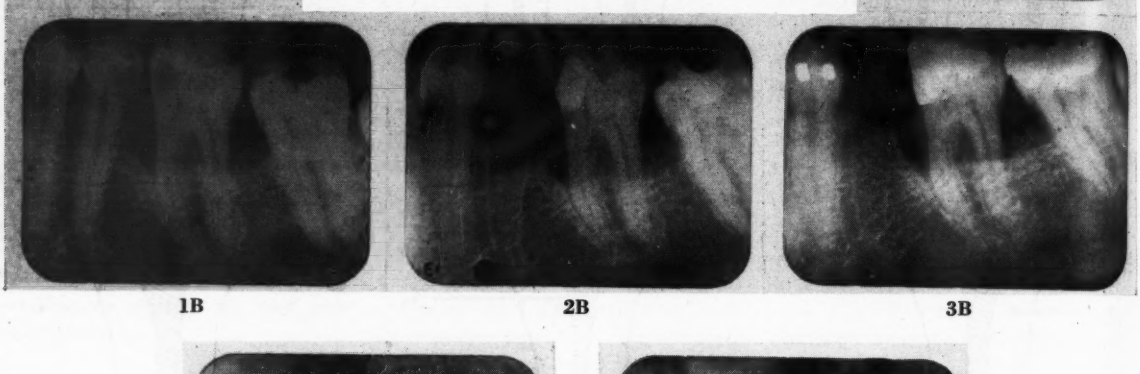
A Satisfactory Vehicle for Penicillin Application—(1) Because of its sedative and bacteriostatic properties, and (2) because it does not materially interfere with the antibiotic action of penicillin, zinc oxide-eugenol is an ideal vehicle for the application and administration of penicillin to the infected pulp. The paste seals the exposure and cavity from outside contamination, and at the same time seals in the penicillin, thereby maintaining an effective cavity and pulpal penicillin concentration.

[18]Bartels, H. A.: Effect of Eugenol and Oil of Cloves on the Growth of Microorganisms, Sec Oral Surgery, Am. J. Orth. and Oral Surg. **33**:458-465 (June) 1947.
[19]Bartels, H. A.: The Effect of Zinc Oxide Eugenol Cement on Penicillin, Sec. Oral Surgery, Am. J. Orth. and Oral Surg. **32**:344-351 (June) 1946.

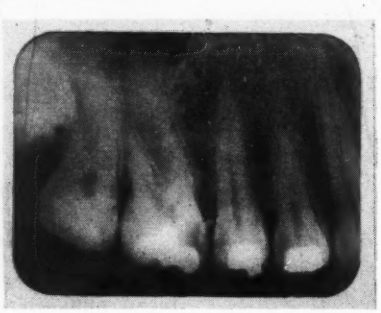
1A

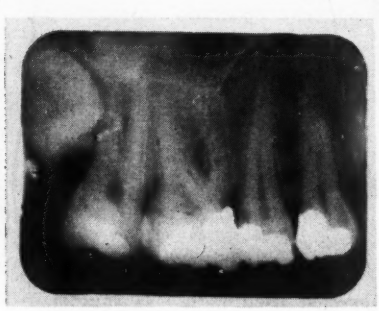
2. ***(1A) Preoperative radiograph, upper left lateral incisor. Mesial carious exposure of the pulp following excavation. (2A) Postoperative radiograph, final restoration in place one year. (1B) Preoperative radiograph, lower right first molar. Mesial carious exposure of the pulp following excavation. (2B) Midoperative radiograph, penicillin-zinc oxide-eugenol dressing in place six weeks. (3B) Postoperative radiograph, final restoration in place one year. (1C) Preoperative radiograph, upper left first bicuspid. Distal carious exposure of the pulp following excavation, and upper first molar, mesial carious exposure of the pulp following excavation. (2C) Postoperative radiograph. Final restorations in place one year.***

2A



1B 2B 3B





1C 2C

Methods

The success or failure of any long range therapy cannot be definitely estimated except over periods approximating the life expectancy of the individual tooth and the patient.

A Preliminary Report—In an encouraging preliminary clinical report on 154 cases, 45 male and 109 female, the elapsed time following pulp capping ranged from two weeks to two and one-half years. Eighty-three maxillary and 71 mandibular teeth were treated. Age range was from four to 58 years and was distributed as might be the average general practice (Table 1).

Types of Teeth Treated—Each patient presented with the pulps of one or more teeth cariously exposed. Ten were deciduous and 144 were permanent; 15 were anterior and 139 were posterior. Surgical (as opposed to carious) exposures of the pulp were not consciously included in the series.

Treatment of Carious Exposures—All carious exposures where the tooth was worth preserving were treated with little regard for (1) the size of the exposure, (2) the location in the tooth or in the mouth, (3) age, (4) sex, (5) previous fillings, symptoms or pain with the following provisions:

1. That the tooth was radiographically negative in the periapical region.

2. That the tooth exhibited some vitality with heat or cold.

3. That the pulp was not necrotic and showed some evidence of hemorrhage at the site of exposure, either spontaneously or upon slight probing.

Operative Procedures—1. Local anesthesia, 1½ per cent monocaine with adrenaline 1/100,000 added was used. For this reason, no pain reactions were recorded.

2. When an exposure seemed imminent, the mouth was packed with cotton rolls and a saliva ejector was inserted. Procedure was continued without rubber dam.

3. Frictional heat was kept at a minimum, and debris was cleared away by the frequent use of a tepid spray of a mildly antiseptic solution (1 to 5) of oral pentacresol, useful also in maintaining cleanliness.

4. The largest possible round burs, Number 8 and Number 9, in posterior teeth (correspondingly smaller burs in smaller or anterior teeth) were used exclusively for excavation purposes.

5. All caries was removed from safe areas of the tooth prior to the

removal of the dentinal caries overlying the pulp. All caries was removed regardless of the resultant pulp exposure.

6. No attempt was made in this procedure to sterilize carious dentin with penicillin. A pulp capping was performed immediately if the pulp itself was not found putrescent and gave evidence of hemorrhage and vitality.

The area of the pulp exposure was sprayed gently and continuously for fifteen seconds. Hemorrhage was blotted carefully without pressure with sterile cotton pellets. Dessication and overheating were carefully avoided.

Penicillin Technique

A fresh vial of 100,000 units of powdered crystalline sodium penicillin G was opened by removing the metal band and rubber stopper. This penicillin does not require refrigeration and hence may be kept in readiness at room temperature in the office cabinet for a period of one year. All the powder was knocked onto a paper slab; portions of eugenol and zinc oxide were also placed on the paper slab. Strict cleanliness, not asepsis, was maintained.

Composition of Dressing—Fifty thousand units of penicillin (about one-half) was first mixed with the eugenol and spatulated until dissolved. Zinc oxide was then slowly added to the penicillin-eugenol mixture until a dense, thick, but not dry paste was obtained. The paper slab was then brought to the chair.

Method of Application—1. The bulk of the remaining 50,000 units of fluffy crystals was lavishly applied directly over the exposure.

2. The flat end of a plastic instrument, a blower, or a small bit of the zinc oxide-eugenol mix was used to pick up the crystals, carry them, and deposit them on the pulpal opening. A slight stinging sensation, attributable to the penicillin, was occasionally noted at this point.

3. The cavity was closed quickly and fully with the penicillin paste, which was tamped lightly (without undesirable pressure) with a wet cotton pellet to be sure that the material sealed the cavity.

4. Sterile space at the site of exposure is considered innocuous and it must be noted that a harmless empty space once occupied by penicillin crystals or an unpacked space may be seen in later radiographs and must not be confused with unexcavated caries.

5. Removal of excess penicillin-zinc oxide-eugenol and a routine check of occlusion followed. Normal occlusion was not relieved.

Instructions to the Patient—When the patient was dismissed he was advised as follows:

1. No chewing or biting was to be done on the side operated on until the next day when the penicillin-zinc oxide-eugenol filling would be hardened.

2. Pain at the site of monocaine injection or in the tooth was to be disregarded for twenty-four hours. A temporary heightened pain response to thermal change was to be discounted also. Medication to control postoperative pain, (1) aspirin, 5 grains, and (2) codeine, ½ grain, was given each patient. For slight discomfort, 5 to 10 grains of aspirin were prescribed. One-half grain of codeine with 5 grains of aspirin were to be taken if necessary every four hours the first day for extremely severe pain from the inflammation resulting from trauma.

3. If, within a week or later, a prolonged steady ache or sporadic aches were felt, the patient was advised to call the office as the prognosis would be poor.

Recuperative Period—The longer the bacteriostatic sedative dressing set, the harder it became. The dress-

TABLE I

AGE, TOOTH DISTRIBUTION, AND CAVITY LOCATION OF 154 CASES

	2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-45	45-55	55-65	Total	Occ	Interprox	Bu	Li
Deciduous Anterior A, B, C	1										1		1		
Deciduous Posterior D, E	3	5									8	4	4		
Permanent Anterior 1, 2, 3				2	1	1	3	4	3		14		14		
Permanent Bicuspid 4, 5			1	7	20**	15	8	7	1	1	60	14	45	1	
Permanent Posterior 6, 7, 8		3	3	12	24	13*	5	9	2		71	13	49	6	3
Total Capped by Location											154	31	113	7	3
Total Capped by Ages	4	8	4	21	45	29	16	20	6	1	154				

Average Age 25.6 years

Each unsuccessful case designated (*)

ing was allowed to remain in the tooth intact for six weeks or even longer.

Fragments of the penicillin-zinc oxide-eugenol cement frequently chipped off but more than enough usually remained in position to cover the exposure and maintain the all-important seal over the pulp. If some cement did crack out it was replaced with zinc-oxyphosphate cement at a subsequent office visit.

The Final Restoration

At the end of a six-weeks rest period, if the tooth remained (1) subjectively asymptomatic, (2) radiographically negative, (3) normally responsive to thermal change, and (4) reasonably sensitive to the drill during the placement of the permanent treatment, the final restoration was completed.

Pulp Insulation—A thin lining of zinc-oxyphosphate cement was infrequently used for additional strength. Extreme care was taken not to dislodge the penicillin-zinc oxide-eugenol dressing immediately covering the exposed pulp. A maximum of penicillin-zinc oxid-eugenol cement was allowed to remain to provide the greatest amount of pulpal insulation possible without serious loss of strength in the permanent restoration.

Choice of Restoration Material—The penicillin-zinc oxide-eugenol cement is quite strong enough as a base material. An immediately placed permanent restoration material, such as silver amalgam, is preferred as a final restoration because there is (1) less trauma in preparation, (2) less danger of dressing displacement, and (3) less time exposed to the outside while being restored.

Cavity Design—For the purpose of the retention of the penicillin-zinc oxide-eugenol cement, the cavity will usually have been excavated and prepared in an amalgam or plastic design. If possible, no drilling should be performed at this time more extensive than the removal of the necessary penicillin-zinc oxide-eugenol cement and the cleaning of the cavity preparation. Prompt adjustment of occlusion on the tooth is desirable at this time but only if trauma is revealed.

Periodic Vitality Tests—The vitality of the teeth operated on was checked at frequent intervals by the following:

(1) Symptomology.
(2) Response to thermal change.
(3) Radiographs.
(4) Sensitivity to percussion.

Analysis of Results

1. The operation on the tooth was considered clinically successful if the following conditions were present:

1) If the tooth was asymptomatic.

2) If the tooth was not sensitive to percussion.

3) If it was radiographically negative.

4) If reactions to heat or cold were normal.

2. Teeth which required extraction or root therapy for any reason associated with pulp capping were considered failures.

3. Teeth were also considered failures in the following situations:

1) Continuing postoperative symptoms.

2) Abnormal sensitivity to percussion or thermal changes.

3) When postoperative radiographs were not negative.

4. Results tabulated in Table II show that of 154 cases treated, 151 were considered successful clinically and only 3 were failures by the standards described.

5. All teeth, except the three considered unsuccessful, have continued to be serviceable and healthy for periods ranging up to two and one-half years.

6. The technique was applied without reference to the age of the patient or the location of the tooth (Table 1).

Conclusions

1. It has been demonstrated that the pulp can continue successful function as any other tissue does, provided (1) that the source of infection is eliminated, and (2) the remaining and re-

ELAPSED TIME SINCE PULP CAPPING

Elapsed Time	Successful — Teeth Still Continuing Healthy Service: Deciduous	Successful: Permanent	Unsuccessful — Extracted–Root Therapy Symptomatic: Deciduous	Unsuccessful: Permanent
*2 weeks**	0	0	0	3
2 wks.—3 mos.	1	28	0	0
3 mos.—9 mos.	2	48	0	0
9 mos.—15 mos.	4	35	0	0
15 mos.—21 mos.	3	15	0	0
21 mos.—27 mos.	0	8	0	0
27 mos.—33 mos.	0	7	0	0
TOTAL	10	141	0	3
Total Successful	151			
Total Unsuccessful				3
Per Cent Successful		98		

*Two week probationary period allowed for initial acute pulpal infection following operation.

Table II. *Shows percent of successful and unsuccessful cases after varying time lapses.*

sultant infection is controlled.

2. Penicillin would seem to have eliminated sepsis (1) on the tooth surface it contacts, (2) at the pulpal opening, and (3) by absorption throughout the pulp.

3. Kolmer[20] has concluded that, properly employed, penicillin may be the means of raising sound surgical procedures to a higher level of therapeutic achievement.

4. It is believed that penicillin therapy accomplishes these purposes and accounts for the high tooth survival rate.

5. All failures were evident within four days postoperatively. Success seems to be indicated if infection does not set in within this time.

6. Successfully treated teeth are considered normal and healthy. They should, however, be checked periodically and cannot be above suspicion if trouble should develop subsequently in the area.

Comments

1. Each patient was advised of his individual prognosis and the deviation from standard treatment.

2. Under the conditions of this research, healing and successfully treated teeth could not be extracted for histologic pulpal examination.

3. Pulp testing was not made a part of this study as until quite recently the pulp testers available for office use were frequently misleading or unreliable. The inadequacies of many of the older instruments have been discussed by Ziskin and Wald.[21]

4. In no case was any toxic reaction to penicillin manifested locally or elsewhere.

5. Use in the future of crysticillin (the procaine salt of sodium penicillin) in place of sodium penicillin is projected. Crysticillin might also be injected periapically at the time of capping to support further the pulpal therapy with penicillin for twenty-four hours by local absorption and systemic recirculation. A series utilizing streptomycin and aureomycin is in progress.

Summary

1. This preliminary clinical report dealing with unselected adult teeth which have vital carious exposures of the pulp indicates a high success rate in pulp capping using penicillin sodium and a penicillin-zinc oxide-eugenol paste.

2. A procedure for capping pulps of vital teeth with sodium penicillin and penicillin-zinc oxide-eugenol paste dressing is described in detail.

3. Additional research and modifications of this technique are in progress.

19 *East 83rd Street.*

[20]Kolmer, J. A.: Relation of Chemptherapy to Dentistry and Oral Surgery with Special Reference to Antibiotic Compounds, J.A.D.A.**35**:13 (July 1) 1947.

[21]Ziskin, D. E., and Wald, A.: Observations on Electrical Pulp Testing, J. D. Res. **17**:79 (April) 1938.

Helpful Tip for Obtaining Correct Centric

M. L. SIMON, D.D.S., Montreal, Quebec

IN ATTEMPTING to obtain the true centric, with the mandible in the most retruded position, the patient often encounters difficulty because of the various positions the mandible may assume. When asked to draw the lower jaw inward, in his over-zealousness to do so, the patient becomes confused and does the reverse.

This difficulty may be easily overcome by asking the patient to do the impossible. He is directed to bring the jaws together and while doing so to *push the upper jaw out.* In attempting to do this, the patient immediately disassociates all thought from the lower jaw, and concentrates on the upper jaw. In this way, the proper centric relationship is obtained with little difficulty.

From *The Journal of the Canadian Dental Association* **15**:261 (May) 1949.

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MATRIX RETENTION

in Class III and Class IV Acrylic Restorations

HENRY I. MEYER, D.D.S., Peekskill, N.Y.

DIGEST

A satisfactory acrylic restoration can be accomplished only if the following requirements in technique are closely regarded by the operator: 1. The application of continuous, steady pressure during the processing period. 2. A wedge separator in position at the gingival margin during the processing period in the restoration of Class III and Class IV cavities.

In a previous article[1] which described a pressure matrix to fulfill these requirements, it was admitted that in many cases the pressure against the matrix was not uniformly applied to the entire restoration. In the tapered tooth the bulge of the matrix at the incisal area materially reduced the pressure applied at that point.

Other matrix retainers have been described in the dental literature and several instruments are available which give a satisfactory uniform pressure for processing the acrylic. The manner in which they are used, however, prohibits the use of a gingival wedge. The following technique eliminates previous defects and fulfills the essential requirements.

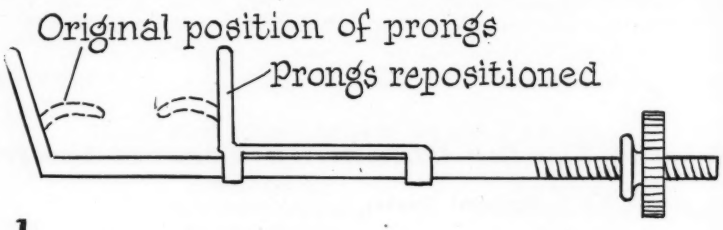
Advantages of a Wedge Separator

The use of a wedge separator is valuable for two reasons: (A) As much excess restoration material as possible beyond the gingival margin can be eliminated. The removal of excess acrylic at any other cavity margin is a simple, rapid procedure. The removal of excess restoration material at the interproximal subgingival area is (1) time consuming, (2) painful, and (3) mutilating to the gingival tissue. (B) Without using a gingival wedge it is impossible to obtain a proper contact area with the adjacent tooth no matter how thin the matrix material.

Matrix Retainer

The matrix holder used can readily be fashioned by any dentist from a Steele's Formatrix clamp. The instrument is constructed as follows:

1. Remove the knurled knob and ease any constriction which prevents the two bars from separating easily.



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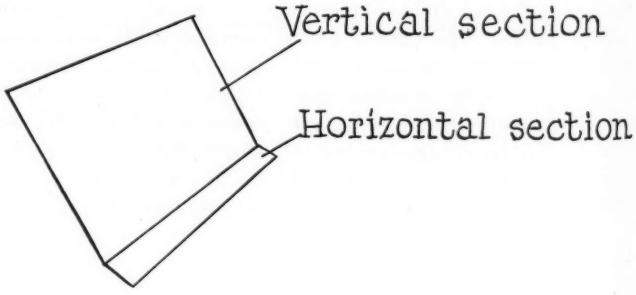

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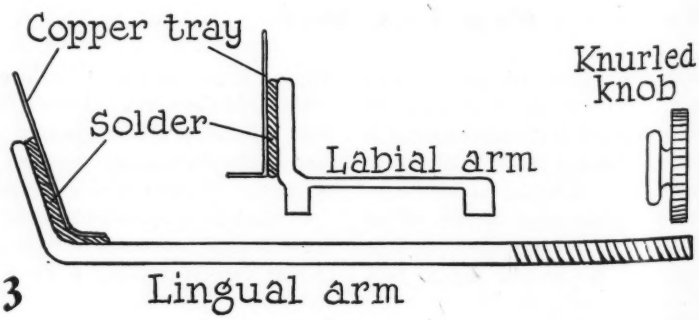
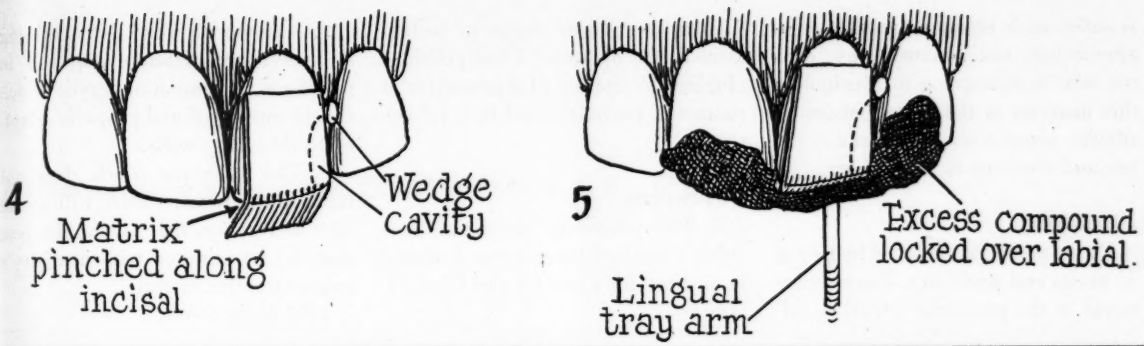


3

[1]Meyer, Henry I.: Pressure Matrixes for Acrylic DENTAL DIGEST **56**:124-125 (March) 1950. 1950.



2. Bend the curved, pointed extensions of the clamp away from the horizontal bar.

3. The labial prong is positioned at an angle of approximately 90 degrees to the horizontal bar.

4. The lingual prong is bent to a slightly obtuse angle to the horizontal (Fig. 1).

5. Two small trays are made from a sheet of copper of sufficient gauge to retain its shape after having been bent to the proper contour (Fig. 2).

Approximate Size of the Trays.—1. Vertical section, 5/8 inch by 5/8 inch. 2. Horizontal section, 5/8 inch by 1/8 inch. 3. The angulation of the vertical and horizontal section of each tray is made to correspond to the angulation of that section of the matrix holder to which it is to be attached.

The Tray is Fastened to the Reshaped Marix Holder—Soft solder and a soldering iron are used to fasten the tray to the reshaped matrix holder. The plating on the matrix holder is removed by means of a file or abrasive stone at the point where solder is to be applied (Fig. 3).

The Impression

Pressure is applied to the matrix to reproduce the lost tooth contour by means of a sectional compound impression.

Method—1. A matrix of soft aluminum foil is placed in position on the tooth and a toothpick wedge is forced into the interproximal gingival area with sufficient pressure to obtain the necessary separation.

2. The labial extension of the wedge is broken off close to the labial face of the tooth. The lingual projection is allowed to remain.

Restoring Tooth Contour—1. If the prepared cavity is a large Class III or a Class IV, temporary stopping is used.

2. If the Class III cavity is not extensive, cotton may be tightly packed into the preparation.

3. The foil is adapted across the labial and lingual of the tooth to reproduce fairly accurate contour.

4. In Class IV the apron of foil extending beyond the incisal edge lingually and labially is pinched together tightly (Fig. 4).

Lingual Part of Matrix is Locked.—1. A sufficient amount of compound is attached to the lingual tray, softened, and adapted against the lingual. The horizontal edge of the tray is carried just beyond the incisal of the teeth.

2. Excess compound which squeezes beyond the edges of the tray is curled over and adapted to a part of the labial face of the teeth adjacent to the one which is being restored (Fig. 5). The purpose of this step is to lock the lingual half of the matrix in position.

The Impression is Left in Position—After the impression has been taken it is unnecessary to remove it until the restoration has been completed. An attempt to remove it at this stage (1) displaces the wedge, or (2) makes it difficult to reposition with the wedge in place.

Allowing the impression to remain in position also eliminates the necessity of holding it against the teeth during manipulation of the labial half of the matrix or the placing of the restoration.

Reproduction Obtained in Compound—1. The labial face of the teeth, compound impression, and the matrix are lightly lubricated after necessary trimming of excess compound.

2. A block of compound is placed in the labial tray, softened, slipped over the lingual bar, and forced against the labial with sufficient finger pressure to obtain an accurate reproduction. The impression is chilled, removed, and set aside.

Restorative Operation

1. The labial part of the aluminum is carefully lifted away and turned back to expose the cavity.

2. The temporary stopping is removed and the cavity thoroughly cleansed and dried.

3. The acrylic is mixed according to the directions for the particular product used and at the proper consistency, and placed in the cavity preparation with considerable excess which is essential to obtain proper compression.

4. The matrix is folded back across the labial face of the tooth.

5. The labial impression is slipped over the lingual projecting bar and the thumb screw is applied and turned down to produce pressure against the restoration.

Processing

The length of time for processing depends on the material used and the bulk of the restoration material. Hasty removal of the matrix is not advised. It is safer to allow a few minutes more than is deemed absolutely necessary to complete the process; ten minutes is suggested as a minimum time for this operation. The belief that pressure for three minutes

is sufficient is bound to result in disappointing restorations. Any dentist who is attempting to manipulate this material in the same manner as silicate cement should abandon its use and continue to use silicate.

Finishing

Excess acrylic is removed by means of stones and steel burs. The requirements of the particular situation will suggest the proper shape of instrument to the operator. Final polish is obtained by the use of a prophylactic paste and tin oxide used in a rubber cup.

Comment

1. The procedure described provides a method for placing a wedge in position for Class III and Class IV cavities.

2. A method is given for obtaining the necessary pressure required in making a restoration of acrylic which is well condensed and properly adapted to the cavity walls.

3. The technique which does not fulfill these requirements will result in a restoration that is not the best that can be achieved with dentistry's new restorative material.

1132 *Main Street.*

Announcement of Books Received

A GUIDE FOR AUTHORS ON MANUSCRIPT, PROOF AND ILLUSTRATION, by Payne E. L. Thomas, Springfield, Illinois, Charles C Thomas, Publisher, 1949.

INDEX TO DENTAL LITERATURE IN THE ENGLISH LANGUAGE, Compiled by Martha Ann Mann, Chicago, The American Dental Association, 1949.

THE NOSE, by Thomas H. Holmes, M.D.; Helen Goodell, B.S.; Stewart Wolf, M.D.; and Harold G. Wolff, Springfield, Illinois, Charles C Thomas, Publisher, 1949. Price $4.50.

A TEXTBOOK OF DENTAL ANATOMY AND PHYSIOLOGY, by Russell C. Wheeler, D.D.S. Second Edition, Philadelphia and London, W. B. Saunders Company, 1950. Price $6.75.

CURRENT THERAPY, Edited by Howard F. Conn, M.D., and consulting editors, Philadelphia and London, W. B. Saunders Company, 1950. Price $10.00.

DIAGNOSE UND THERAPIE DES INFIZIERTEN WURZELKANALES, by Florian Prader, D.M.D. Basel, Switzerland, Benno Schwabe & Co., 1949. Imported by Grune & Stratton, Inc., New York. Price Fr. 26.

JEST WHAT THE DOCTOR ORDERED, by Francis Leo Golden, D.D.S., New York, Frederick Fell, Inc., 1949. Price $2.95.

THERAPEUTIC EXERCISES, by Hans Kraus, M.D., Springfield, Illinois, Charles C Thomas, 1949. Price $6.50.

SURGICAL AND MAXILLOFACIAL PROSTHESIS, by Oscar E. Beder, New York, Columbia University Press, 1949. Price $3.00.

CYTOLOGIC DIAGNOSIS OF LUNG CANCER, by Seymour M. Farber, M.D., and Collaborators, Springfield, Illinois, Charles C Thomas, Publisher, 1950. Price $6.00.

ORAL HYGIENE AND PREVENTIVE DENTISTRY, by Russell W. Bunting, D.D.Sc., and Collaborators, Philadelphia, Lea & Febiger, 1950. Price $5.00.

THE MERCK MANUAL OF DIAGNOSIS AND THERAPY, Edition Eight, Rahway, N. J., Merck & Co., Inc., 1950.

CLINICAL APPLICATIONS OF SUGGESTION AND HYPNOSIS, by William T. Heron, M.A., Ph.D., Springfield, Illinois, Charles C Thomas, Publisher, 1950. Price $3.00.

ODONTO-STOMATOLOGIE, Volume 1, Zahnartzliche Prothese and Mundhohlen-Carcinom, by Max Spreng, M.D.; Gasser, Fritz, M.D., D.M.D.; and Ernst Oppikofer, M.D., Basel, Switzerland, Verlag Birkhauser, 1949. Price Fr. 23.50.

ODONTO-STOMATOLOGIE, Volume 2, Zahnmedizin, by Max Spreng, M.D., and Collaborators, Basel, Switzerland, Verlag Birkhauser, 1949. Price Fr. 20.

Elimination of PERIODONTAL POCKETS

ABRAHAM BERLINER, D.M.D., Brooklyn, N.Y.

DIGEST

In discussions concerning the recognition and clinical treatment of periodontal lesions, operative procedures are often the first consideration while the basic reactions of the tissues receive brief and superficial attention.

For this reason, the removal of local irritating factors has been made the initial step in many cases. It was found that it was possible to control the progress of the disease by eliminating the inflammatory process. Experience demonstrated that complete and meticulous removal of foreign matter from the hard wall of the periodontal pocket is the first requisite in the reduction of the lesion.

The technique employed in the removal of foreign matter is extremely delicate and precise; as an adjunct to the highly developed digital skill demanded, a special instrument has been created. The technique in which the instrument has been successfully used is fully described in this article.

Recognition of the Periodontal Pocket

In the scientific approach to the periodontal problem, it is imperative to recognize the pathologic pocket exactly for what it is: The most clinically apparent aspect of the presence of a disease process. *The pocket is not the disease*[1] but rather a definite physical symptom of a disease process characterized by an apical shift of the epithelial attachment on the root of a tooth.

The Primary Factors Involved—A proper biologic approach to the periodontal problem is concerned initially with the primary factors responsible for its existence. Orban[2] has classified these elements as follows:

1. Local aggravating factors.
2. Systemic conditioning factors.
3. Inherited weakness of the organ.

Origin of the Disease—It is generally conceded that 70 to 80 per cent of all periodontal disease has its origin as a result of calculus deposition. Calculus probably represents the greatest single irritant as a primary aggravating factor in the production of the local lesion. The research work of Rapp[3] represents the soundest approach to this problem.

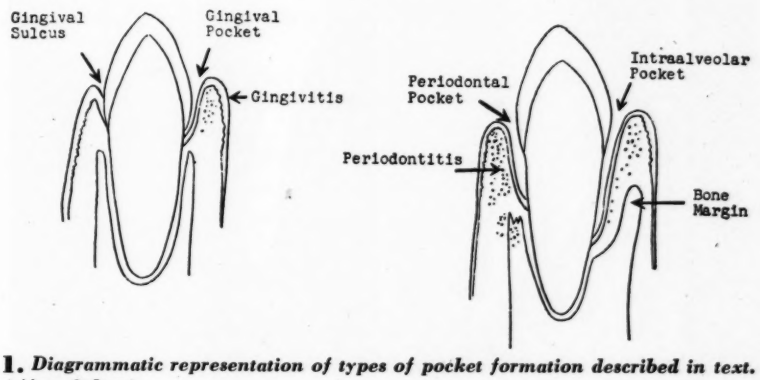
Contributing Factors—Other local force components in pocket causation are (1) ill-fitting crowns, (2) overhanging margins of fillings, (3) loss of normal contact point relationship, (4) food impaction areas, (5) traumatogenic occlusion, and (6) habits, such as tongue or lip sucking. These may all be considered mechanical factors. Chemically, the irritation may be produced by a histaminic breakdown of food products associated with bacterial activity.

Three Types of Pockets—The types of pockets generally recognized (Fig. 1) are the following:

1. The absolute pocket which is dependent on the relative position of the epithelial attachment.
2. The relative pocket, dependent on edematous, hypertrophic, or hyperplastic condition of the gingivae.
3. The intrabony pocket, dependent on the position of the pocket in relation to the lateral level of the supporting bone.

The Role of Inflammation

Acute Inflammation—1. All local periodontal disturbances have their



1. ***Diagrammatic representation of types of pocket formation described in text. (After Orban).***

[1]Postgraduate Course, Tufts College Dental School, June, 1948.

[2]Postgraduate Course, Colorado Dental Foundation, September, 1947.

[3]Rapp, G. W.: Biochemistry of Oral Calculus, Part Two, The Presence of Carbonic Anhydrase in Human Saliva, J.A.D.A. **33**:191-194 (February) 1946.

2. ***Photomicrograph showing field over-run with polymorphonuclear leucocytes characteristic of acute inflammation. Arrows indicate the leucocytes.***

origin in part in acute inflammation. This has been described by Menkin[4] as the manifestation of cellular injury in reaction to the presence of an irritant.

2. In the case of gingival injury the most common cause is calculus with the superimposed influence of invading organisms and their toxins.

3. There is a vascular, lymphatic, and tissue response: the reaction consists of a number of interdependent sequences which can lead to repair if the causative agents are removed.

The Sequelae of Acute Inflammation—1. Resolution and Recovery.

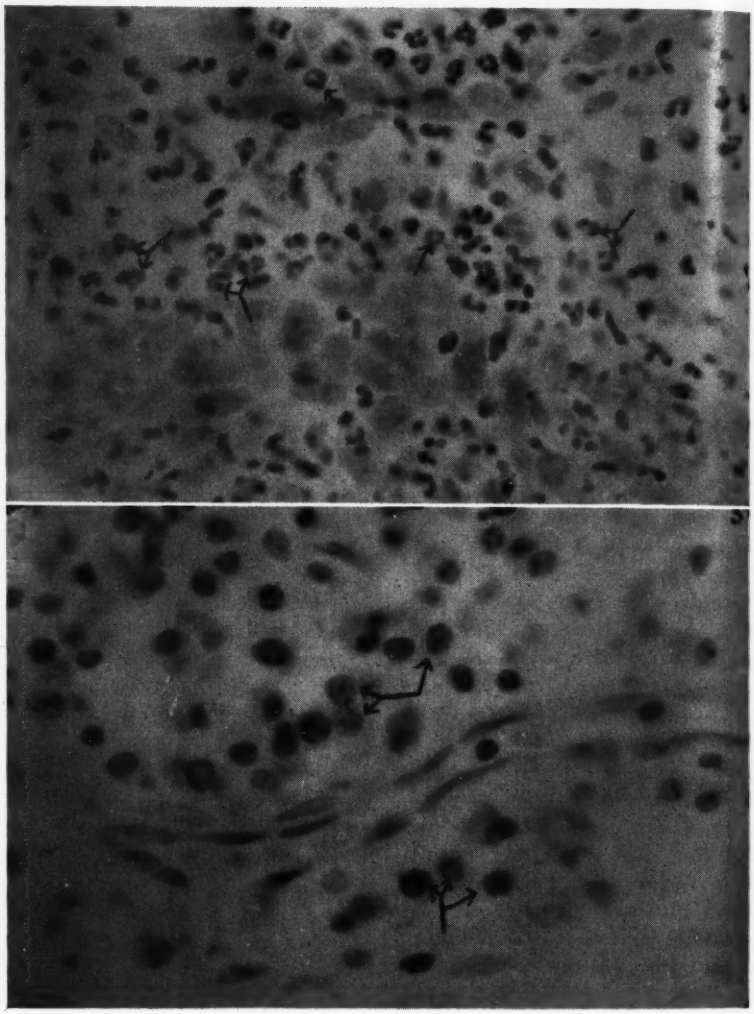
2. Transition to chronic inflammation.

3. Abscess formation.

4. Gangrene.

Chronic Inflammation—In practice, the most common problem is the long standing, chronic, suppurating lesion.

[4]Menkin, Valy: Dynamics of Inflammation, New York, The Macmillan Company, 1940.



3. ***Photomicrograph showing field over-run with plasma cells, characteristic of chronic inflammation. Arrows indicate plasma cells.***

4. ***Photomicrograph of interproximal tissue indicating chronic nonpurulent zone below the level of the epithelial attachment.***

5. ***Gross appearance of Ivory file against the root surface of a tooth. (After Bodecker).***

The Transition—The following changes in the tissues accompany the transition from acute to chronic inflammation: 1. Microscopically (Fig. 2) the acute picture which is characterized by the presence of great numbers of polymorphonuclear leucocytes, changes to a field over-run by round cells. This plasma cell infiltration is pathognomonic of chronic inflammation (Fig. 3).

2. The pH of the tissue fluid changes from alkaline (characteristic of acute inflammation) to acid (characteristic of chronic inflammation) in which leucocytes undergo liquefaction necrosis.

3. The bone begins to show a progressive loss, quantitatively, associated with deepening of the pocket. Below the horizontal level of the epithelial attachment is a zone of

6. ***Photomicrograph of section (block) with heavy deposits of supra and subgingival calculus.***

chronic, nonpurulent inflammation, and below this zone the tissue appears normal (Fig. 4).

Types of Clinical Treatment

1. Many operators agree that there should be a reduction in the depth of the pocket, (1) by repair, or (2) by the surgical removal of the soft wall of the pocket.

2. A pocket of 1/3 millimeter is considered by some the desired depth for maximum health.

3. Others are of the opinion that a pocket of even greater depth is permissible as long as the tissue remains healthy.

4. In a number of closely observed cases it has been possible to control the progress of many of the local lesions by the removal of the aggravating factors which eliminated the inflammatory process.

5. The systemic factors, if present, must be diagnosed and, if possible, brought under control.

Elimination of the Periodontal Pocket—1. Removal of the local aggravating factors is accomplished by the use of expansion of the soft wall of the pocket with the aid of baseplate gutta percha.[5]

[5]Berliner, Abraham: The Use of Pocket Guides and Expansion to Facilitate Instrumentation in Treatment of Periodontal Disease, J.A.D.A. **35**:191-194 (August) 1947.

2. The procedure for subgingival instrumentation (1) eliminates the hazardous practice of blind scaling and (2) emphasizes the fact that extraordinary digital skill is not essential to accomplish thorough instrumentation.

3. The tooth and root surfaces are carefully planed and polished. Resorption of the edema, inflammatory cells, and tissue debris by phagocytic activity will result. This represents the initial phase of the resolution of the inflammatory process.

Recovery of the Cells—The second consideration is the recovery of the affected cells, for as long as the nucleus of the cell is not involved it will recover.

Formation of New Tissue—The regenerative phase of the repair process, the formation of new tissue, is least under control because the process varies with the age of the patient and is influenced by local and systemic factors.

Comment—Complete and meticulous removal of the foreign matter from the hard wall of the periodontal pocket is the prime prerequisite for its ultimate reduction.

Technique for Removal Of Foreign Matter

1. The standardized techniques used for the removal of foreign matter from tooth surfaces fall short of the desired aim of planing the tooth surfaces smooth and free of the debris.

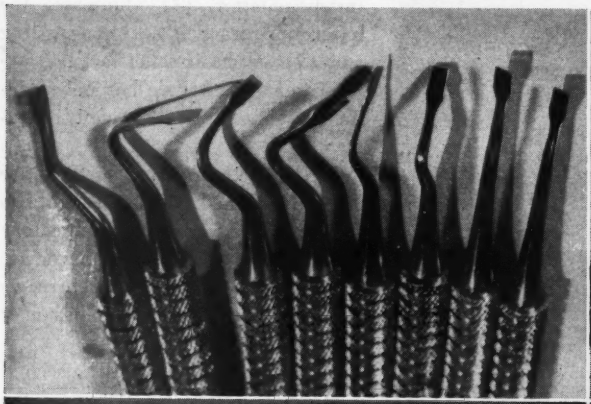
2. It has been found that the technique which employs the pull movement of the cutting edge of an instrument results in scratching, scraping, and scarring of the surfaces.

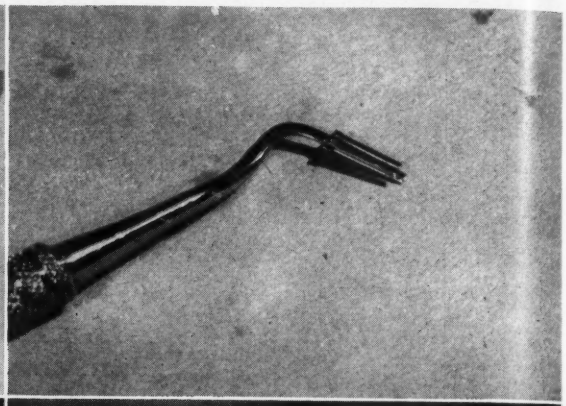
3. Of particular significance is the fact that these scratches and scars remain as focal niduses which facilitate the reformation of calculus which adds to rather than retards the vicious cycle of foreign matter deposition and the necessity for its removal (Fig. 5).

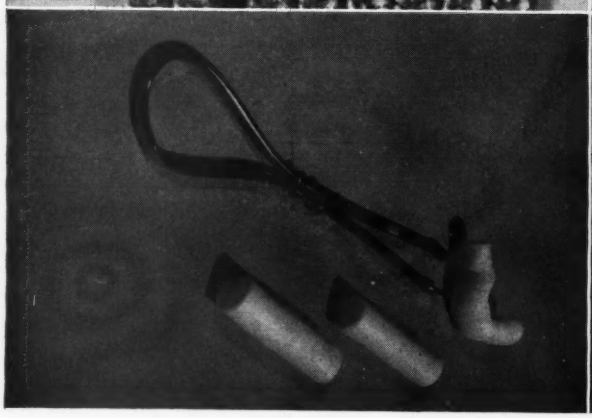
4. Microscopic studies present evidence that the removal of all the infragingival calculus is exceedingly difficult by the routine scaling meth-

7. ***Photograph close-up of hollow ground blades recommended for planing.***

8. ***Photograph of a self-limiting epithelial scalpel.***







9. ***Cotton roll holder with loop used for cleansing dorsum of tongue.***

10. ***Cotton roll holder with cotton roll engaged. Used with flour of silex, for polishing; used with ice water for gingival stimulation.***

ods because of the clumsiness of the instruments available.

The Prolem of Subgingival Calculus—According to Bodecker,[6] photomicrographs of sections of teeth affected by periodontoclasia show (1) that the supragingival calculus can be removed easily, and (2) that by expert scaling, most, *but probably not all*, subgingival calculus can be eliminated (Fig. 6).

Recurrence of Inflammation—1. Clinically, the gingivae returns to a normal condition after careful scaling, medication, and massage by the patient, but it is a common observation that the inflammation recurs after a comparatively short time. It is probable that this relapse is due to the presence of remnants of subgingival calculus in the base of the gingival pocket.

2. The inflammation of the marginal gingivae disappears when the supragingival calculus is removed but remaining minute particles of subgingival calculus continue to act as an irritant which results in a spread of the inflammation and finally a relapse.

The Cause of Inflammatory Relapse—The lack of an extremely developed tactile sense and digital skill which present-day scaling techniques demand is basically responsible for the failures and relapses encountered in the treatment of periodontal disease.

A Special Instrument—Because of the limitations of present-day armamentarium, flexible-shanked, hollow ground, push planers have been designed and constructed (Fig. 7). These instruments were designed to remove foreign matter and calcific deposits by lateral displacement, minimizing the physical and technical hazards of scaling and thus helping to prepare the tissue environment at a level most conducive to functional repair with maximum tissue conservation. A preliminary report[7] on a clinical experiment analyzing the biologic rationale of the application of these instruments has been made.

Technique for the Use Of the Instruments

1, After the root surfaces have been planed clean, with the aid of

[6]Bodecker, C. F.: The Difficulty of Completely Removing Subgingival Calculus, J.A.D.A. **30**: 703-708 (May) 1943.

[7]Berliner, Abraham: A Clinical Experiment for the Determination of a Biologic Rationale for Periodontal Prophylactic Instrumentation, Dental Items of Interest **70**:1206-1214 (December) 1948.

a porte polisher they are highly polished with flour of silex or finely meshed cuttle-fish. These polishing agents are used in the finishing of optical lenses, an excellent recommendation for their dental use.

2. The epithelial-lined soft wall of the pocket is stripped with a self-limiting epithelial scapel. This instrument is designed to peel a measured thickness of tissue from the lining of the soft wall of the pocket. Its tip is so contoured as to engage the epithelial attachment at the apex of the pocket, making it possible to remove an intact sheet of tissue with the epithelial attachment. In this way a clean, free bleeding underlying connective tissue corium is exposed, uncontaminated by shreds of epithelial tissue debris (Fig. 8).

Organization of the Blood Clot—The blood clot which forms in the pocket space is kept small and encouraged to organize. Failure to protect the integrity of this clot is one of the greatest single factors responsible for periodontal pocket remission and the reason why clinical demonstration of a true biologic reattachment is a rarity, rather than the rule.

Protection Against Traumatic Injury—For complete organization of the clot to form new connective tissue, bone, and cementum the following conditions must be ensured: (1) The tissue at the site of the injury must be protected against traumatogenic impulses during mastication, and (2) the contiguous teeth must be stabilized either by splints or ligatures. According to Stirling,[8] it takes approximately two weeks before an organization into bone takes place.

Oxygen Therapy — Biologically, the repair potential is enhanced by the use of local oxygen therapy. This treatment adjunct has the following favorable effects: 1. It diminishes the oxygen hunger suffered by chronically inflamed tissue.

2. It alters the pH of the tissue fluid from acid to alkaline.

3. Oxygen destroys the plasma cells and provides an environment in which polymorphonuclear leucocytes may function.

4. It lends a biologic momentum to the re-establishment of normal metabolism of the cellular elements involved at the site.

[8]Stiring, R. I.: Report of an Investigation into the Process of Healing of Fractured Bones, with Some Clinical Applications, Edinburgh M. J. **39**:203-228 (December) 1932.

The Basis of Clinical Practice

1. Maintaining the dental apparatus and its supporting tissues at optimum health for the greatest numer of years is the common denominator of all clinical practice. It has been estimated that approximately 80 per cent of the known diseases suffered by mankind gained entrance into the body through the mouth. The significance of this fact makes it the responsibility of dental practitioners to recognize the importance of a physiologically clean environment in the maintenance of optimum oral health.

2. It is generally agreed that the mouth is an almost perfect incubator for bacterial culturing. The mouth provides heat, moisture, food pablum, and detritus, the ideal environment for bacterial growth.

3. The recesses between the filiform and pedunculated buds which cover the dorsum of the tongue, provide almost perfect acterial nests from which, uninterrupted, increasing numbers of pathogenic organisms are fed into the oral cavity. This is clinically substantiated by the familiar "coated tongue" present in the majority of patients.

4. The establishment and maintenance of a physiologically clean oral environment is of vital importance for the prevention of remission of a treated periodontal case.

The Purpose Of the Technique

The technique described was evolved in an attempt to accomplish the following conditions:

1. The employment of an uncomplicated instrument hard enough to polish the tooth surfaces and yet soft enough so that its use would not result in soft tissue laceration or traumatic abrasions of the tooth substance.

2. To provide tissue stimulation on a level that would (1) excite and activate a healthy circulation of the blood in the area, (2) lend itself to improvement of the tone and integrity of the blood vessels, and (3) keratinize the surface texture of the mucoperiosteum.

3. To institute a simple means for cleaning and polishing the interproximal surfaces of the teeth so that the incidence of calculus formation would be materially decreased.

Additional Aids

1. It was found that the toothbrush failed to fulfill these requirements adequately.

2. The use of cotton rolls with flour of silex met the requirements most successfully (Figs. 9 and 10).

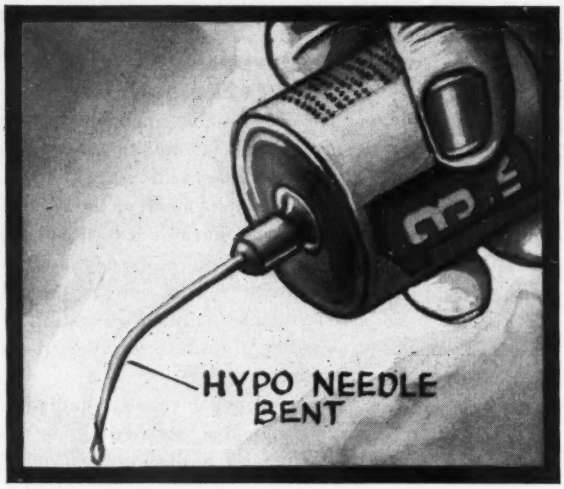
3. Tissue stimulation was accomplished by intermittent pressure on the gingivae with a cotton roll dipped in ice water.

4. Interproximal cleansing and polishing was effected with the use of wedge-shaped balsa wood sticks or rubber tips.

Conclusion

Although it is recognized that the application of these procedures is not the total answer to the periodontal prolem, it is believed that a step closer to the solution has been made.

1 *DeKalb Avenue.*



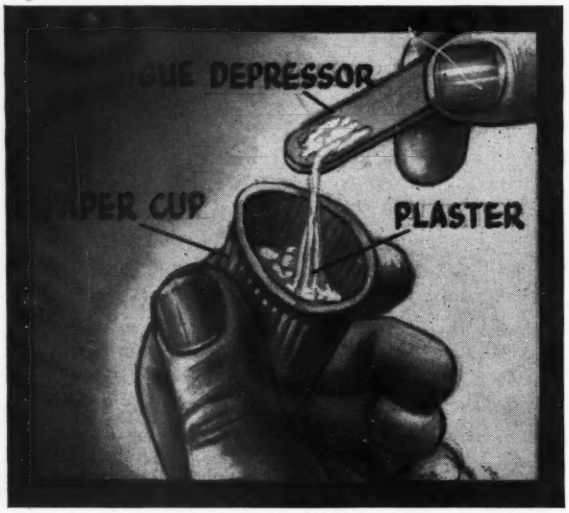
1

Clinical and Laborator

Oiling the Dental Engine

Shelton E. Breeden, D.D.S., Bay City, Texas

1. Bend a hypodermic needle of any desired gauge and adapt it to the spout of a can of light oil. This will make an oil can that may be used conveniently to oil the dental engine or any other mechanism that is not easily accessible.

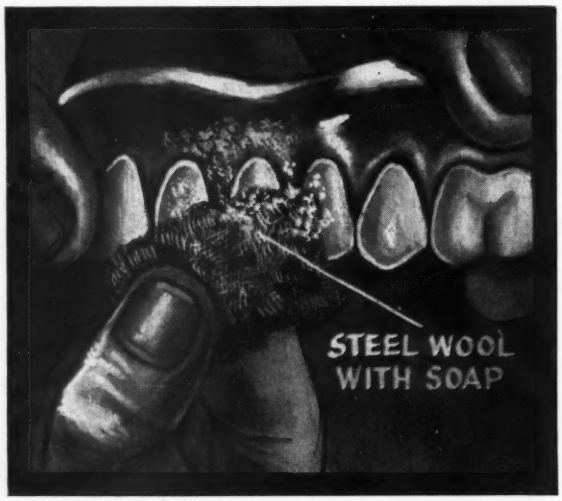


2

An Individual Plaster Bowl

Nathaniel J. Coyne, D.D.S., Hoboken, N.J.

2. Mix plaster in a paper cup with a wood tongue depressor. After use both may be discarded.



3

Cleaning Dentures

Harold Miller, D.D.S., New York

3. To remove polishing agents or sordes from dentures, *gently* rub with soap-impregnated steel wool. The size and shape of the steel wool makes it ideal for cleaning the tissue surface of the denture as well as the denture teeth and other surfaces.

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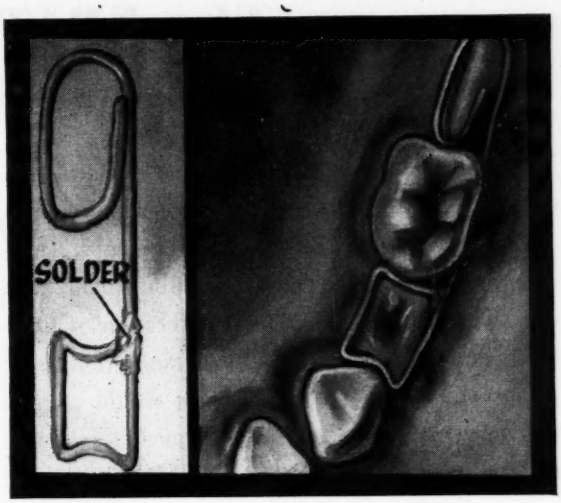
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Measuring an Edentulous Deciduous Space

William P. Humphrey, D.D.S., Denver

1. Bend a paper clip into shape to fill the space of the missing deciduous tooth. Solder to maintain this shape. Instruct the parent to insert the appliance once a week. If the space begins to close, the appliance will not go to position. Then it is time to make a space retainer.

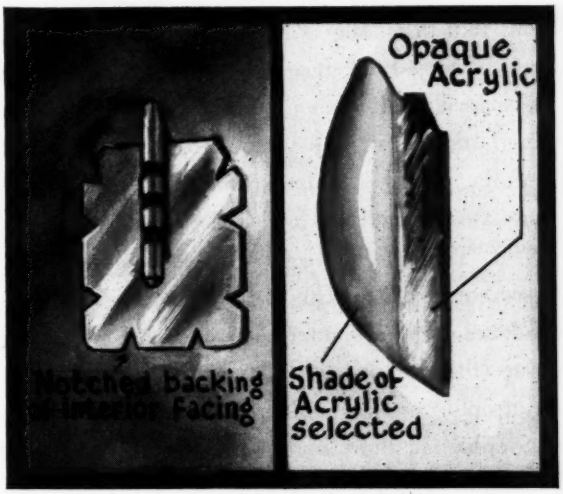


4

Application of Acrylic to a Steele's Backing

Samuel Silver, D.D.S., Chicago

5. Notch the metal backing to create additional retention. Cover the metal with opaque acrylic. Apply self-curing acrylic of the proper shade. Contour, and hold under pressure.

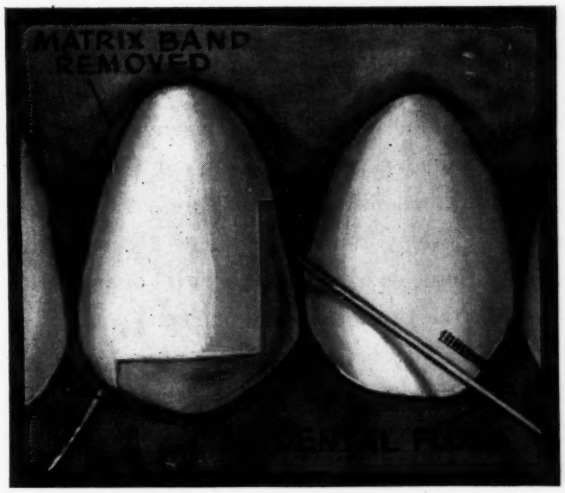


5

Removal of Amalgam Overhangs

M. F. Cerkovnik, D.D.S., St. Michael, Minn.

6. Place a 4-inch strip of dental floss in the interproximal space before placing the amalgam matrix on the tooth. After the amalgam is packed, remove the matrix band and use the floss to trim any gingival overhang. In removing the floss, pull it out buccally so it will not injure the contact point.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Turn to page 408 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

DENTISTS SHOULD be aware that the widely discussed anterior pituitary and adrenal hormones, ACTH and cortisone, have potential dangers. These compounds have been shown to inhibit wound healing. These hormones inhibit proliferation of fibroblasts and depress body growth, granulation tissue formation, and osteogenesis. This would suggest that an extraction or any other surgical wound will not heal well in the presence of excessive adrenal cortical hormonal activity.

The Alarm Reaction which is a part of the general adaptation syndrome may be described something like this: The organism suffers a shock or stress of some kind. It may be a fever, the invasion by bacteria or foreign protein, a surgical or accidental trauma, or a psychic impact. The adrenal medulla produces epinephrine. The epinephrine stimulates the anterior lobe of the pituitary to form ACTH. The ACTH stimulates the adrenal cortex to secrete cortisone. The liberation of this hormone produces certain anatomic changes: All lymphatic tissue (the thymus, spleen, lymph nodes) share in an atrophic process and the lymphocytes and the eosinophils in the circulating blood are reduced. Fibroblasts are depressed in places where they are needed as well as in regions where they are not desirable. The fibroblasts in blood vessels may be decreased and the skeleton may undergo demineralization under ACTH or cortisone therapy.

ACTH is a pure protein the function of which is to stimulate the adrenal cortex to activity. It cannot be synthesized. Cortisone is a steroid hormone that is related to cholosterol. At the present time cortisone is derived from ox bile by a complicated chemical process of thirty-two steps. Cortisone may some day be recovered from plants.

In an address before a seminar of the American Academy of Periodontology Doctor Jerome W. Conn of the University of Michigan highlighted these facts concerning ACTH and cortisone:

1) At the present time they should be considered as extremely important investigative tools but not as harmless therapeutic agents.

2) They change the host reaction and not the number or virulence of bacterial invaders.

3) They do not cure rheumatoid arthritis. They merely improve the clinical manifestations. The underlying disease is not affected. Disease manifestations return three to four days after withdrawal although a few sufferers have had relief for several months.

4) A euphoria follows the use of the hormone which occasionally becomes manic. Mental depression follows withdrawal.

5) Allergies are promptly relieved under treatment.

6) Acute conditions that require only two or three injections are often improved spectacularly. Chronic conditions show no lasting improvement.

Selye,[1] writing on the general adaptation syndrome of which the Alarm Reaction is a part, explains: "The inhibition of wound healing and regeneration by gluco-corticoids raises the possibility that mineralo-corticoids may act inversely, but this remains to be shown.

"The frequent occurrence of purulent infections (e.g., pulmonary, renal, or hepatic abscesses) in animals and the occasional development of peritonitis in man treated with large doses of glucocorticoids suggests that these hormones may be useful tools in the analysis of inflammations in general."

Any reaction that unfavorably affects wound healing, causes a marked decrease in resistance to infection, and is associated with inflammatory phenomena, is a subject that should be of vital concern to dentists.

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[1]Selye, Hans: Stress and the General Adaptation Syndrome, Brit. M.J. No. 4667:1383-1392 (June) 1950.

MEDICINE and the Biologic Sciences

Jaundice

Jaundice is a condition in which the bilirubin level in the blood serum is abnormally high. When the concentration of the pigment rises above a certain level a significant and visible yellowish discoloration of the scleras, skin, and mucous membrane occurs. The discoloration may be a faint lemon tinge observable only in the sclera or it may become a deep yellow pigmentation of the skin.

Bilirubin appears in the urine and sweat but does not pass into the saliva or milk nor as a rule into the cerebrospinal fluid. The clinical appearance of jaundice depends on the amount of bilirubin circulating in the blood stream. Despite a wealth of knowledge about the disease, many patients with jaundice present a baffling problem in differential diagnosis.

There are two principal phases in the etiology: (1) Jaundice may be a manifestation of the formation of large amounts of bilirubin through excessive disintegration of red blood cells (as observed in hemolytic anemias) beyond the capacity of the liver cells to filter it out of the blood. (2) Jaundice may be a sign of a disturbed liver function in which the liver cells are diseased or injured by toxic agents. Thus their capacity of removing even a small amount of bilirubin from the blood is diminished.

There are many extrinsic factors which play a serious part in the production of jaundice. Each patient presents a problem of his own.

Bile is continuously secreted by the liver cells. It passes along the bile capillaries and the hepatic and cystic ducts to be stored in the gallbladder or to pass on to the duodenum. Bilirubin is the chief pigment component of human bile. There is only a small amount of biliverdin which is an oxidative derivative of bilirubin.

These bile pigments are produced by the destruction of red cells. About 25 grams of hemoglobin are liberated daily as a result of normal erythrocyte destruction. Approximately 15 to 20 grams are utilized in the production of new red blood cells and 5 to 9 grams undergo degradation to bilirubin. The liver normally excretes 200 to 300 milligrams of bilirubin daily in the bile. This represents 4 per cent by weight of the hemoglobin from which it is derived.

The reticulo-endothelial system; namely, the bone marrow, the spleen, some lymphatic glands and the Kupffer cells of the liver and the tissues, is involved in the metabolism and formation of bile pigments. Bilirubin is derived from hemoglobin of disintegrated red blood cells by a process of hydrolysis.

From the amounts of bile pigments excreted daily by the liver it is readily seen that a large amount of hemoglobin is liberated from the disintegrated red blood cells in twenty-four hours. It has been estimated that in health about 10 million red cells are destroyed every second. It follows that the same number must be formed by the blood-forming tissues. The loss of hemoglobin is about 25 grams daily. The life of the average red cell is eighty to a hundred and twenty days.

Any condition which leads to increased destruction of red cells causes a greater production of bile pigment. It is easy to understand that jaundice and many other diseases may arise when this delicate balance between the formation and destruction of red blood cells is disturbed.

Recognition of jaundice is not difficult. However, clinicians agree that its differential diagnosis is difficult for the following reasons: 1. Many difficulties are encountered in the determination of the functional efficiency of the liver. 2. Treatment is complicated. 3. Surgery is often indicated but only after exhaustive laboratory tests and painstaking examinations.

Badia, Pasquale D.: Jaundice, Am. J. Surg. **79**:387-398 (*March*) 1950.

Clubfoot

One of the commonest of congenital abnormalities is clubfoot in its various forms. The deformity is noted in about 1 of every 1,000 live births.

The parents of a child so affected usually want to know the probability of a similar outcome in subsequent pregnancies. And rightly so, as detailed family histories reveal the presence of other similarly afflicted persons in 15 to 20 per cent of the families. However, the majority of cases are isolated occurrences.

In those instances in which the family history is positive, as many as 7, 8, or even 11 affected persons distributed in an apparently regular or irregular fashion over three or four generations have been reported. In cases in which a child with congenital clubfoot has been born to normal parents, the probability of a recurrence of this event in any subsequent pregnancy can be placed at about 0.03.

Detailed observation and statistics of families presenting clubfoot in some of its members vaguely suggest that the condition is associated with other disorders of the skeletal system. Spinal disorders as detected by roentgenographic examination are sometimes noted.

Although it may be regarded as well established that in some families the occurrence of clubfoot is strongly conditioned by genetic factors, the exact nature of these factors remains obscure. Clubfoot may be the end re-

sult of several different anatomicophysiologic processes. And each of these processes is probably under the control of a different genetic mechanism.

Nell, James V.; Falls, Harold F.; and Jest, Avery R.: A Pedigree of Clubfoot, Am. J. Dis. Child. **79**:442-448 (*March*) 1950.

Calcium Requirement of Adults

There is a greater need for calcium in the adult than was formerly recognized. This is true even though the bones and teeth are formed and only small amounts of calcium are needed for other vital body functions.

Three basic reasons account for this need for calcium: (1) There is a constant endogenous loss of calcium ions from the body. This daily loss varies tremendously in persons, but is sufficiently large so that if not replaced, calcium is drained from the bones to make up the deficit. (2) Extra calcium intakes are stored in the trabeculae of the bones. This constitutes an essential reserve in cases of emergency such as repair of fractures of the bones and the increased demands in women during pregnancy and lactation. Lack of such calcium stores in these emergencies may cause a drain of calcium from the bones. A severe case of such loss causes osteomalacia, the adult counterpart of rickets. (3) Adults (and children) do not utilize 100 per cent of the calcium of food, even in milk whose calcium is readily available. Recent studies show that only 15 to 35 per cent of the dietary calcium can be used by man.

In view of these facts the National Research Council has suggested in its newly revised Recommended Daily Allowances, that the calcium requirements of all adults, regardless of size, weight, or activity, be increased by 25 per cent from 0.8 grams to 1.0 grams per day.

The utilization of minerals is different from that of organic nutrients. The organic nutrients, such as the fats, proteins, carbohydrates or vitamins, are broken down into simpler units and merged into a common metabolic pool from which they may emerge (1) reconstructed into new essential compounds, or (2) further broken down to nonutilizable end products of metabolism. These end products are excreted as waste from the lungs, skin, kidneys, and intestines. In this manner there is a large daily loss of organic elements from the body.

There is no such breakdown and disposition of useless materials with the minerals. The minerals do not become unavailable inasmuch as they are not altered or destroyed in the process of metabolism. The inorganic minerals are just as available for (1) the reconstruction of new body cells, tissues, or enzymes, (2) the maintenance of proper osmotic pressure, or (3) of the hydrogen ion concentration of the blood when they are released through metabolic processes as when they are picked up as inorganic ions by the blood from the dietary supply in the intestinal tract. Therefore, in the adult, the maintenance requirement for calcium ions through the kidney, the digestive glands, and the linking of the intestinal tract is due entirely to simple physicochemical processes.

Woods, Ruth: The Calcium Requirement of Adults, Borden's Review of Nutrition Research **9**:1-12 (*November*) 1948.

Hearing Aids

No one knows exactly how many persons with impaired hearing there are in the country. In 1945 an analysis was conducted by the American Hearing Society. It revealed the following: (1) there are between 10 and 15 million persons who are hard of hearing in one or both ears, (2) there are between 5 and 8 million persons with serious acoustic handicaps, (3) approximately 600,000 hearing aids have been put to use, (4) between 3 and 4 million persons need hearing aids, and (5) there are more than 1 million children with impaired hearing in the public schools. There is no doubt that these figures would be greater were such an analysis conducted today.

Audiology is the science of hearing. Within the past eight to ten years advances in (1) diagnostic techniques, (2) medical therapy, (3) surgical procedures, (4) electronic design, and (5) audiologic methods of communicative retraining have constituted a really tremendous development in the field.

Two fundamental facts are recognized today: (A) That the great majority of persons with hearing impairment, both children and adults, possess some useful amount of residual hearing. (B) That, with the use of suitable amplification carefully selected for the person's needs and with basic training in the use of this amplification incorporated into daily habits, the person with impaired hearing can usually learn to compensate reasonably well for his disability.

With the development of the midget vacuum tube the hearing aid began to offer a genuine benefit. Even the best of hearing aids is no panacea. Yet the best of them now are precision instruments, light in weight, durable, relatively free from electronic distortion, and reasonably comfortable to wear.

The hearing aid is a device to make sound louder. The modern vacuum-tube hearing aid is similar in construction to a public address system. It consists of a transmitter, a receiver, and a set of batteries to supply power.

A hearing aid should meet five basic requirements as outlined by the Office of Scientific Research and Development. These are: (1) sufficient power to bring audible sounds to the impaired mechanism, (2) tolerability; that is, audible, and if possible, intelligible sounds must be brought to the ear without causing pain, tickle or serious discomforts, (3) fidelity; other things being considered, the aid should amplify normal speech without distortion, so far as the factors causing distortion may be properties of an aid, (4) wearability; the ear-

piece or headband and the instrument must be wearable without undue discomfort, and (5) sufficient sensitivity and amplification. It is desirable that the aid should make intelligible to the wearer ordinary speech at conversational loudness.

For maximal benefit from air-conduction instruments, a properly fitting earpiece is an essential. It is recommended that this earpiece be used in the process of selecting the right aid for the person. Earmolds are now made of acrylic materials.

There are two major types of problems among the hard of hearing: (A) The person who belongs to the "louder please" category. His problem is caused by a conductive lesion whereby the passage of sound from the external ear through the middle ear is interfered with. This type derives much benefit from an aid. (B) The person who belongs to the "I can't understand you" category. This person needs clarity as well as some loudness. Acuity for high tones is always more affected. He may receive benefit from an aid but usually only after patient cooperation.

So far as has yet been demonstrated the use of a suitable hearing aid neither improves nor injures the otic condition. The needs of the particular person are determined by the nature of the physical problem and of the behavioral problems. These are best met by interested and extensive professional follow-up.

Hardy, William G.: Hearing Aids, Postgrad. Med. **7**:11-17 (*January*) 1950.

Effects of Alcohol

The ingestion of alcohol in various concentrations is a widespread practice in our scheme of living. Alcohol does have definite effects on the various body systems. Such information is of value in understanding the actions and reactions of human beings.

(1) In the mouth alcohol increases salivation. (2) In the stomach alcohol increases the secretion of gastric juice. (3) Concentrations over 5 per cent retard digestion. (4) The production of pancreatic juice is inhibited by concentrations over 2 per cent. (5) Alcohol dilates the cutaneous blood vessels, thus producing the well-known flushing of the face.

The feeling of warmth after taking alcohol is deceptive, because this feeling is associated with rapid heat loss. Occasionally, the heart beat is accelerated by alcohol. The same effect may be obtained by holding 50 per cent alcohol in the mouth.

Small amounts of alcohol, up to 0.1 per cent in the blood, increase respiratory movements but amounts over 0.2 per cent are followed by some inhibition of respiration. Again, the stimulating effect of alcohol is in doubt inasmuch as the carbon dioxide output is decreased during the stage of increased respiratory activity.

The most important action of alcohol is on the nervous system. Small doses of alcohol appear to have a stimulating action by giving the drinker a feeling of well-being and increased self-control and self-confidence. Unfortunately he also has a loss of judgment and of the ability of self-criticism.

The apparent stimulation is the result of the narcotic action of alcohol on the inhibitions. This depressant action involves first of all the higher centers of the brain, which are responsible for acquiescence to the habits of civilization.

The dulling of the feeling of responsibility allows the more primitive cerebral functions to dominate. The fallacy of the stimulating effect of alcohol is greatly enhanced by the drinker who is convinced that he is performing better when he is under the influence of alcohol.

In the psychic sphere alcohol causes a paralysis of certain parts of the brain. The finer grades of attention, judgment, reflection, and ability to comprehend are lost. This explains, to some extent, the typical behavior of persons when under the influence of alcoholic drinks.

"The soldier becomes more courageous since he observes the danger less and reflects upon it less. The speaker is not tormented and influenced by the proximity of the public; therefore he speaks freer and with more animation. One's self-appraisal rises greatly. Often one is astounded at the ease with which he expresses his thoughts and with the keenness of his judgment in matters which are beyond his mental sphere when sober. Later he is ashamed of this delusion. The drunken individual attributes to himself great muscular strength and wastes this through unaccustomed and useless exhibitions of strength without thinking of the harm which may ensue."

Queries and Minor Notes: Effects of Alcohol, J.A.M.A. **142**:859 (*March* 18) 1950.

Hyperventilation

Medical research is constantly giving us a greater insight into the problems of yesterday and today. By the same token it presents many new problems to be answered.

It is recognized today that emotional conflicts probably account for a longer list of ailments than any other etiologic factor. Many patients are difficult to treat as they feel that there must be an organic basis for their troubles. And when no evidence of organic disease can be detected, they go from doctor to doctor, from specialist to specialist, from quack to cultist, with no relief.

One annoying complaint in these patients is hyperventilation. The condition can be a symptom both of functional and organic disease.

Hyperventilation properly means respiration beyond the physiologic requirements of the organism. Normally, the rate and depth of respiration are delicately balanced and adjusted to the body's needs and are regulated chiefly by the concentration of carbon dioxide in the blood stream. This active and physiologically important gas is the chief factor in the respiratory regulation.

Patients presenting hyperventilation are termed psychoneurotic hyperventilators. Women are more commonly affected than men. And despite

CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 402 *and* 403)

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Explanation of Procedure:

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the outstanding symptoms the basic cause of the symptoms frequently is unrecognized.

Anxiety states with hyperventilation as the outstanding manifestation were common in the depression years of the thirties. And probably there are relatively as many patients today with anxiety states.

The symptoms can be extremely alarming or terrifying to the person. A fairly constant pattern is noticed: (1) Lightheadedness, (2) dizziness, (3) tingling of hands and feet, (4) palpitation or heart consciousness, and (5) muscle cramps. (1) Muscle weakness, (2) apprehension, (3) fear of collapse, and (4) a general loss of self-confidence should also be emphasized. To appreciate some of these symptoms one has only to practice hyperventilation to the utmost extent of capacity for a period of three to six minutes.

From this point on the problem is more difficult as the answers to the following questions must still be found: (1) Through what mechanism do emotions stimulate respiration beyond the needs of the organism? (2) How can this imbalance be controlled? (3) What is the relationship between the overbreathing and the alarming symptoms which it produces? (4) Must we rely on clinical evidence alone for diagnosis or can a simple satisfactory test be found to determine the presence of hyperventilation?

Early treatment of hyperventilation must be aimed at relief from disturbing symptoms. Restoration of adequate carbon dioxide to the system gives prompt relief. Strength returns, the mind clears and self-confidence is restored. Immediate relief may be obtained by rebreathing into a paper bag. Such measures not only alleviate symptoms but have educational value, leading to voluntary control of respiration. Education is the most potent measure in treatment.

Short, James J.: Hyperventilation, Postgrad. Med. 7:85-94 (*February*) 1950.

BUY SECURITY BONDS

(This quotation is taken from a recent letter)

"I have received my copy of Visual Education in Dentistry with my subscription to Dental Digest. I find that this book of charts affords a wonderful opportunity to explain dentistry to the patient, and I therefore am requesting another copy of this Visual Education."

The above *voluntary* comment is typical of letters we receive almost every day. It typifies the manner in which *Visual Education In Dentistry* is received in countless thousands of dental offices. Its terse "wonderful opportunity to explain dentistry to the patient" is the chief reason for this series of 31 charts which is now in its tenth reprinting. And this practitioner's request for a second copy is the rule rather than the exception—one copy for use in the operatory and one copy for the reception room.

CONTENTS

1. Dental Conditions
2. Development and Eruption of Teeth
3. The Progress of Tooth Decay
4. Why Construct a Bridge?
5. How Irregularities of the Teeth Affect the Face
6. Modern Porcelain Restorations
7. The Expense of Poor Dentistry
8. The Development of Root-End Infections
9. A Stitch in Time Saves Nine
10. When the Dentist Fills the Tooth
11. "Things Are Not Always What They Seem . . ."
12. The Development of Jaws and Teeth
13. Diseases of Teeth and Trees
14. The Collapsed Face
15. The Dangers from Pyorrhea
16. "Be Not the Last to Lay the Old Aside . . ."
17. The Foundation's the Thing
18. Insulation
19. "One Rotten Apple May Spoil a Bushel"
20. The Circulation of The Blood
21. Pyorrhea Treated or Neglected
22. The Action of Local Anesthesia
23. "A Little Neglect May Breed Mischief . . ."
24. The Fifth Cranial or Trigeminal Nerve
25. Danger Begins at Six
26. How a Full Denture Fits
27. How the Loss of Teeth Affects the Face
28. The Dangers from the Impacted Tooth
29. What Does the X-RAY Show?
30. The Requirements of a Correct Restoration
31. Development of the Skull

The present reprinting of *Visual Education In Dentistry* is identical with the previous edition with one exception—a new four-page two color chart entitled *THE DANGERS OF PYORRHEA AND POSSIBLE COMPLICATIONS.* It portrays possible complications in the blood stream which could stem from a pyorrhetic condition. Patients can readily assimilate this type of presentation. This is only one of the 31 charts in the complete booklet (see titles of the other 30 charts in the box on the left).

The chart *WHY CONSTRUCT A BRIDGE?* (see miniature reproduction on opposite page) is in constant use in dental offices everywhere. Many practitioners have it framed for easier use and preservation.

Twenty of the charts are printed in *full* color; 8 are printed in two colors. Only 3 are in black and white. All can be used effectively in educating the layman to understand the value of periodic dental care and the dangers of neglect. Isn't this an important problem in your practice?

The old bugaboo, fear of pain, is *slowly but surely* being overcome in the mind of the layman. And the regular use of the charts in *Visual Education In Dentistry* can help make this problem an easier one for you and the patient. The potential good will and better health cannot be overestimated.

The original edition of *Visual Education In Dentistry* contained only 12 charts and sold for $1.00 to regular subscribers and $2.00 to non-subscribers. The latest reprinting (31 charts) sells at the same prices despite terrific paper and printing increases over the years. We have always taken the attitude that the profit motive isn't the important factor in the dissemination of material of this highly ethical type.

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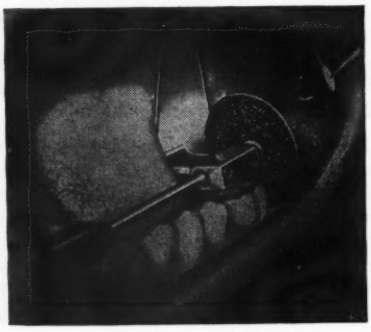

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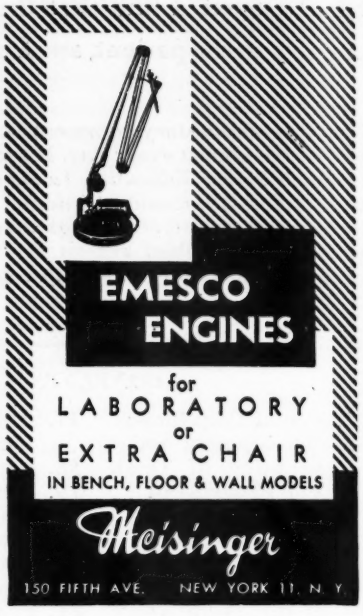
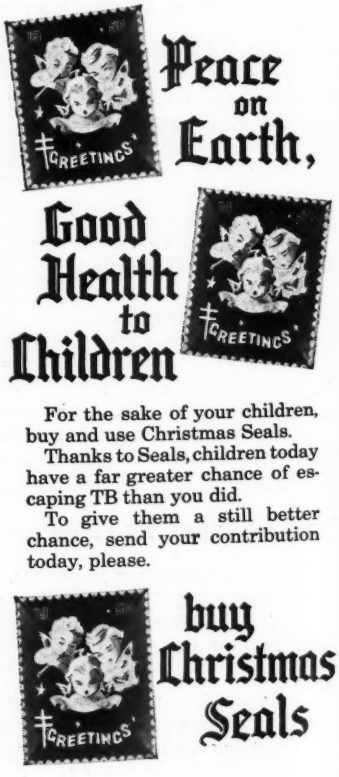
Contra-Angles

Advertising Is Not Enough

A million dollars is a lot of money to be spent for an advertising campaign. That is the amount that the American Medical Association will spend the week of October 8 in the newspapers, radio, and magazines of the country. The cost of this advertising will be met by physicians of the country who will pay for the campaign out of their increased membership dues. The advertising will be pointed against compulsory health insurance and for voluntary health insurance, a commendable objective.

From the campaign American dentists may get the idea to undertake a similar effort. Before they do it should be well to take a critical look to determine if this is the time and paid advertising is the method to use to influence public opinion. My own guess, as one inexpert in public opinion molding, is that the timing of the AMA advertising is poor, very poor. Here would be my bill of particulars: We are in a war and when a war is being fought congressional effort is directed to its winning, not to social reforms. Social legislation is promoted in the quiet days of peace and the national health program is social legislation. For the present, the agitation for compulsory health insurance is nonexistent and spending a million dollars to fight a phantom appears to be wasteful, particularly when a real adversary is fighting us in the flesh. People are more concerned with the present war than with future legislative threats. They are interested in immediate and adequate care for soldiers. They have pushed the subject of socialized medicine out of their minds for the present. By the time there is renewed activity for compul-





For the sake of your children, buy and use Christmas Seals.

Thanks to Seals, children today have a far greater chance of escaping TB than you did.

To give them a still better chance, send your contribution today, please.

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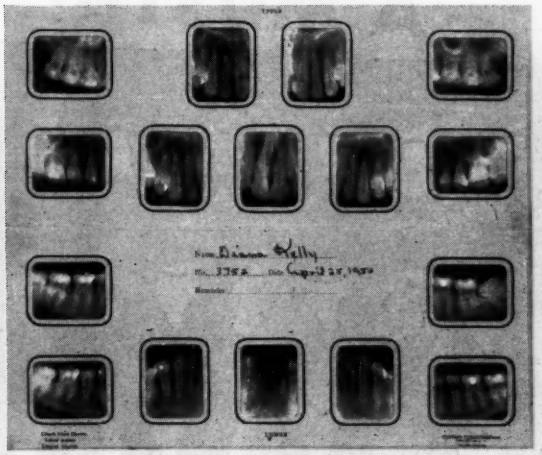

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2. Use Kodak Concentrated Processing Chemicals—Kodak Concentrated Dental X-ray Developer . . . Kodak Concentrated Dental X-ray Fixer. Tested ingredients, compounded with laboratory care.

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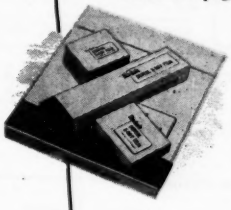

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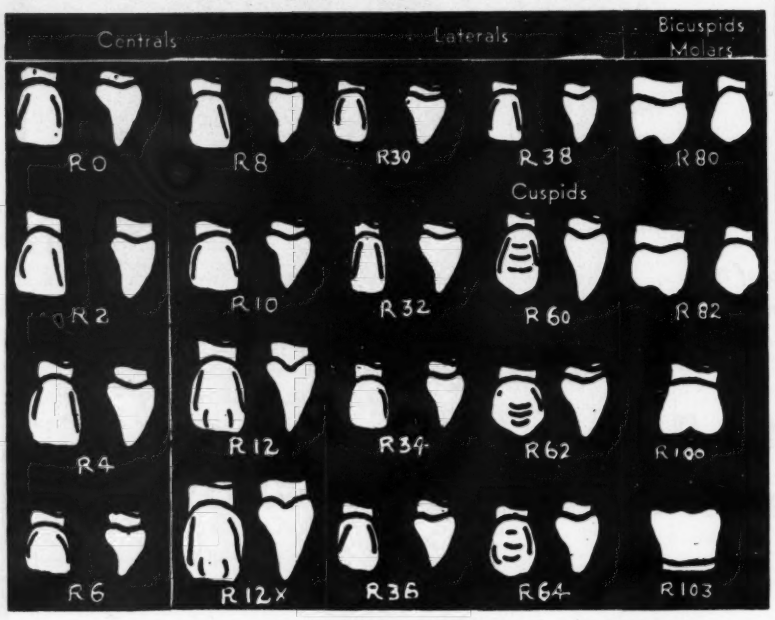

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sory health legislation the public will have entirely forgotten the AMA advertising campaign. In fact, it probably will be forgotten by Christmas of this year.

Gratuitous advice on what to do with money is always peevishly received by one's family, friends, or an organization. Telling the AMA what they might have done with the million dollars comes in that category. The money could have been put aside to be used at a more effective future time when compulsory health insurance was again a threat. A million dollars for propaganda is not in good taste during a war and this expenditure may boomerang and show itself to be poor public relations. Rather than winning friends and supporters among the public, it may alienate people.

We might also suggest that the money could have been more constructively spent at present in promoting medical activities that would be important in civilian defense—organizing first aid teams, blood banks, ambulance units, vaccination and inoculation programs, practical nurses' training courses. The public would have reacted favorably to be told that the AMA was organizing for the medical needs of the nation in an emergency. That would be good public relations.

To sponsor voluntary health insurance and oppose compulsory health insurance will strike a favorable response with many people and is certainly a worth-while undertaking. That is, provided voluntary health insurance may be purchased at a price within the means of the average family. The constantly rising cost and upward premium adjustment for voluntary programs now in force is not an encouraging trend. For example, the premium rate for Blue Cross hospital care insurance has been increased several times and in some communities it is now necessary for the beneficiary to make an additional cash payment to the hospital. It is true that hospital operating costs for labor, fuel, upkeep, and food have increased substantially, making higher hospital rates necessary. But regardless of the legitimacy of the reasons for increas-

ing costs for voluntary health programs, people will feel disquietude if there are unpredictable cost changes. Their feeling of security will be disturbed and security is the essence of all types of insurance. If people feel that a voluntary health insurance contract is a flexible and elastic document they may prefer one that carries the federal and compulsory label; at least one that is supervised by the federal government.

The million dollar advertising copy has this expressed objective: "The principle which the AMA copy will seek to strengthen and bulwark is the basic American ideal of individual freedom, individual initiative and freedom of opportunity under a free economy, as opposed to the alien philosophy of a Government-regimented economy." The writers of this declaration have mislaid the past fifteen years in which a shifting emphasis has been observed in American economic society: the tendency to put security before freedom. That may not be a good philosophy, but it is at the heart of all social security legislation to protect against old age, unemployment, and ill health; it is in the essence of the demands by labor unions for retirement pensions.

Actually, there is no choice available between a "free economy as opposed to the alien philosophy of a Government-regimented economy." A free economy is one of the frontier where there are no income or excise taxes, no Security and Exchange Commission, no federal bank deposit insurance, no Interstate Commerce Commission, no Reconstruction Finance Corporation, no rationing, price or rent controls, or wage freezes. The frontier days of blessed memory are past. In an industrial society with many divisions of labor and diversifications of industry it is essential for a central government to act as a coordinator and often as a restraining force. We should like to think that the coordination might be done efficiently and unobtrusively, and with a minimum of interference with personal liberty. We doubt if a compulsory health insurance system would operate in that way. Far better, it seems to me, to oppose a federal compulsory health insurance system on the basis of inefficiency, waste, red tape, and the interference with the private lives of people. Dragging in the emotional and spurious struggle between a "free economy and an alien philosophy of a Government-regimented economy," will not be too well received because it is not in tune with the facts of present economic life.

I sigh with discomfort at the irony when I observe the physicians of the country setting aside their flaming individualism to undertake a collective effort to influence public opinion by paid advertising during wartime. I hope that they will feel that their million dollars were well spent. Quite likely I am an old fossil but I hope that the dentists of the country will not follow the same road. It seems to me that the more subtle form of opposition is best; the kind that we have used effectively in the past fifteen years.

When medicine uses the tools of expensive lobbying and paid advertising, and spends millions of dollars to influence public opinion, no wonder the public puts medicine in the category of big business and physicians in the group of pleaders for selfish interests. The physician appears best in the role of understanding friend and family counsellor, in the unselfish devotion to service and science tradition. The hallowed tradition is far more effective than the crisp man-of-business projection. Someone, I fear, sold American medicine a bill of goods that will not wear well or long appear becoming.

That the AMA itself is ambivalent on the subject of the traditional physician versus the business-man physician is suggested by an article appearing in the *Journal of the American Medical Association* two months (August 5, 1950) before the million dollar advertising program got under way. The article is a reprint of a story by the distinguished journalist, Malcolm W. Bingay, that appeared in the *Detroit Free Press*. Mr. Bingay wrote:

"The true physician must have the courage of a priest in being the father-confessor for many sins and yet not lose his faith in his fellows. A general instills courage in his soldiers by his

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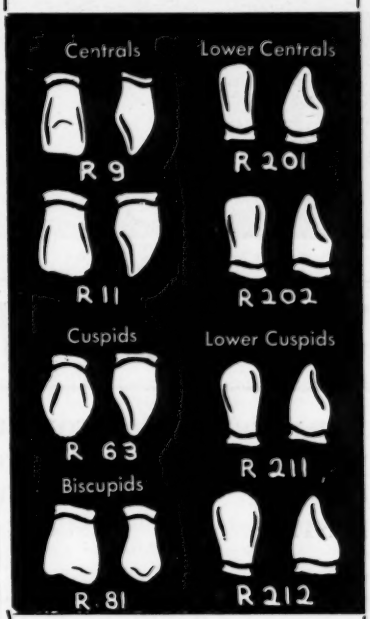

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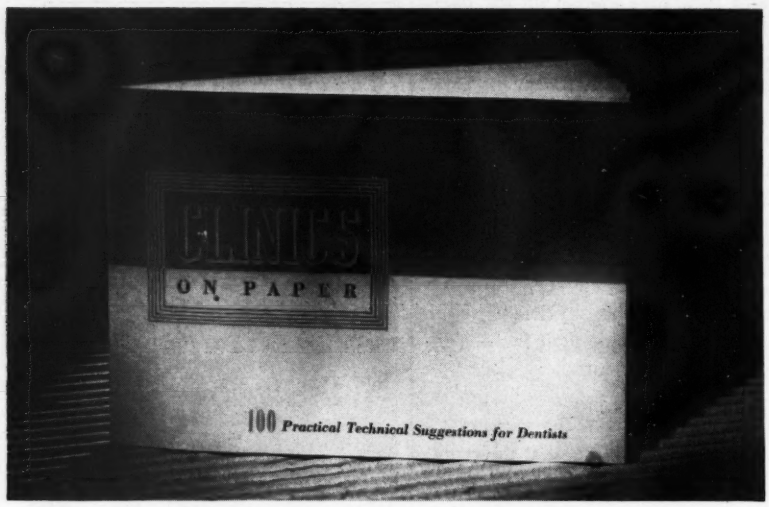

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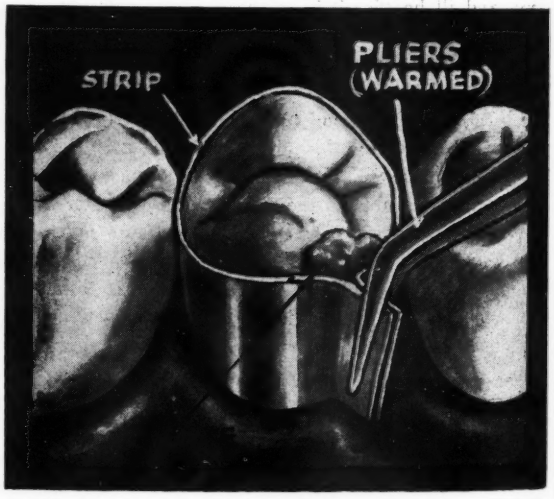

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inspiring presence; so it is with the physician. He must keep alive the light of faith not only in his patient but in his patient's family and in himself. His will must dominate when his heart is filled with doubts. He holds a human life in the hollow of his hand and must have the God-given courage to keep that hand cool and steady. . .

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"Yours is the most poignant and gripping and all-consuming drama of life."

It is significant that Mr. Bingay with his roots deep in journalism has not suggested that the AMA follow the ways of the market place and use paid advertising to tell its story. "The magic chain," "the binding force," are the physician's "human contacts." Take these away, make the physician the impersonal business man who advertises, exhorts over the radio, and uses the tools of salesmanship and propaganda and we strip medicine of its most powerful tool. The struggle against compulsory health insurance may be won by medicine staying close to the "spiritual values, the days—and more—the long nights of patient fighting, great tenderness and sacrifice . . . " These are the values that the American people wish to preserve in their physicians. These are the values that physicians must practice in their lives. These are the values that would be lost in a compulsory health system. Advertising these virtues will not be a substitute for *living* them.—E. J. R.

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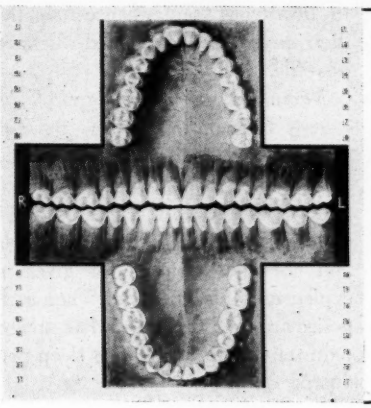

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A New Analgesic Combination for Routine Use in Control of Pain

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The Value of Narcotics in Pain

Although the administration of narcotics for relief of pain is regarded as a blessing by the sufferer, much unhappiness has followed when addiction or habituation has resulted from continued use of narcotics. There are many instances when a patient suffers pain or discomfort which requires very little raising of the pain threshold to secure his relief.

Pain Intensity Difficult to Measure

The fact that pain is a purely subjective manifestation places it at a speculative level. Pain sometimes persists despite large doses of narcotics and at other times apparently severe pain is relieved by relatively small doses of narcotics or analgesics.

The Problem of Pain Control in Surgical Practice

Almost every patient suffers some degree of pain after operation. The promiscuous use of habit-forming narcotics, however, has frequently led to disastrous consequences so that their use should be avoided whenever possible.

Narcotic Value vs. Analgesic Value—It is difficult to separate the narcotic value of a drug from its analgesic value. In one instance, the patient does not show signs of active suffering because he goes to sleep and does not mention, or gives no evidence, of his suffering. When analgesics are used the patient has greater pain relief with little or no sleep producing effect.

The Importance of Sleep and Rest There are times when sleep and rest are of great importance to the body's economy. At such times narcotics are definitely indicated and should be given. At other times the question of sleep and rest are of minor importance and analgesics may serve as well as narcotics.

Patient Requirements Vary—1. Some patients, especially elderly people or children, might be harmed by a narcotic.

2. Patients who have had surgery performed on the mouth, tongue, or neck would be less likely to aspirate blood and mucus if narcotics were avoided. In these patients, analgesia may be all that is desired.

3. In bone and joint surgery, analgesics are much less likely to upset the patient's general health than narcotics.

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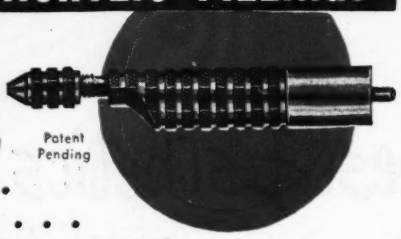

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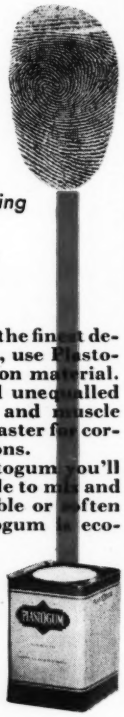

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their analgesic effect. It has been found that therapeutic effects can be obtained by oral absorption of a combination of acetylsalicylic acid and benzosulfimide.*

Results of Administration Dramatic—The results obtained following sublingual administration of this compound have been so dramatic that it can be concluded that such results could hardly have been produced so rapidly if the salicylate mixture had had to reach the blood stream by the intestinoportal pathway.

Direct Absorption of the Drug—It is belived that this combination reaches the blood stream by direct absorption from the sublingual, buccal, and pharyngeal walls, thus short-circuiting the much longer intestinoportal route. The rapid effect may be similar to the instantaneous effects produced by sublingual administration of nitroglycerin. It has been suggested that acetylsalicylic acid in the blood stream is responsible for the more rapid analgesic effect.

Results of Experiments—Although these interesting experimental findings cannot be explained satisfactorily, the clinical observations have been so impressive that they are being recorded in this preliminary report in order that others may avail themselves of this simple therapeutic measure.

An Additional Value—The combination of acetylsalicylic acid and benzosulfimide makes the mixture palatable but the fact that it can be given by mouth without the simultaneous administration of fluids is of special value in patients who have had surgery of their gastrointestinal tract when the oral administration of fluids is usually interdicted.

Conclusions

1. Sublingual administration has been found extremely helpful in patients who suffer the usual pains and discomforts of surgery. These tablets may not entirely eliminate the need for narcotics but they may supplant narcotics in a great many instances.

2. The instantaneous effect of this

*Theryl is a trade name for this combination. The material for this study was supplied by the Church Chemical Corporation of Chicago, Illinois.

drug probably results from direct absorption from the mucous membranes of the mouth, pharynx, and hypopharynx.

3. Oral absorption is particularly desirable in patients who cannot have fluids by mouth.

4. The therapeutic effect of the drug is probably due to acetylsalicylic acid which is absorbed more rapidly and efficiently as a result of its combination with benzosulfimide.

5. The nonhabit forming character and low toxicity of this combination give it a wide scope of usefulness.

Adapted from *The Illinois Medical Journal* **97**:150 (March) 1950.

Penicillin Dosage Recommended Before Dental Extractions for Patients with Heart Disease

A STATEMENT approved by the American Council on Rheumatic Fever of the American Heart Association recommends specific dosage for the administration of penicillin before dental extractions in rheumatic persons or patients with congenital heart or blood vessel defects to prevent the possible development of subacute bacterial endocarditis. The text of the statement follows:

Following dental extractions, bacteria are frequently present in the blood stream for short periods of time. In rheumatic persons or in patients with congenital heart disease these bacteria may lodge in the heart valves and cause bacterial endocarditis. Although a variety of bacteria cause this disease, the majority of cases are due to alpha streptococci, (streptococcus viridans). Alpha streptococci are usually resistant to sulfa drugs. Penicillin is, therefore, recommended for prophylaxis.

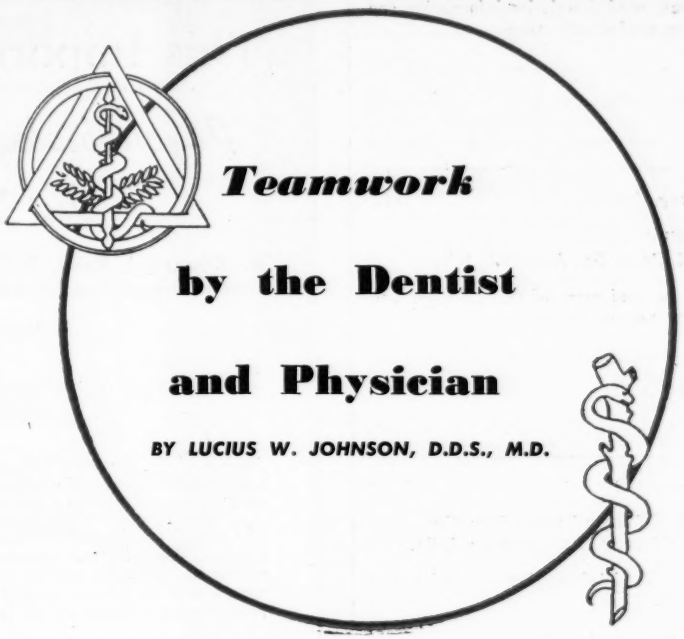
1. Except in emergencies operative procedures in rheumatic persons should be deferred until there is no clinical evidence of rheumatic activity and laboratory tests indicate that the rheumatic process is subsiding.

2. Patients should be free from upper respiratory infection.

3. Minimum dosage of penicillin:

(*Continued on page* 424)

In your ORAL HYGIENE this month



"It is time for the rank and file of practitioners of medicine and dentistry to join forces and work for survival," warns Doctor Lucius W. Johnson—who is both dentist and physician. He refers not only to the threat of Government-controlled health service, but also to the need for closer cooperation between members of the two professions in treating the patient. He lists ways in which the individual practitioner can increase this cooperation. You will want to read this article rather carefully.

★ ★ ★

"Do Dentists Want Social Security?" Though the House of Delegates of the American Dental Association has gone on record as opposing the inclusion of dentists in the Social Security plan, Doctor Rolland B. Moore believes that their statement does not reflect the opinion of the majority of dentists. He explains that Social Security is an ideal way for the dentist to save for retirement and secure a small income that will be adjusted to meet fluctuations in dollars and prices. He believes that most dentists want the advantages of Social Security, and chides the House of Delegates for speaking for all dentists instead of allowing them to speak for themselves.

★ ★ ★

Here's a dentist, Doctor Arthur Berger, who spends leisure hours separating mauling wrestlers—and thoroughly enjoys it. Doctor Berger has been prize fighter, scrapper, wrestler, and now referee.

★ ★ ★

Do people postpone dentistry because of fear? . . . Doctor C. W. Garleb thinks not. He believes that carelessness, not fear, causes normal adult patients to postpone their dental treatment so long. His article is well worth serious thought.

★ ★ ★

North Carolina has answered a state-wide need by establishing its first dental school at the University of North Carolina at Chapel Hill.

★ ★ ★

How many times are you called "Mister" instead of "Doctor," asks Doctor Thomas E. Foley. He writes an interesting article explaining the need for better understanding, on the part of the public, of the educational background and training of the dentist, and deplores the unethical advertising that has lowered the dentist in public esteem.

★ ★ ★

Doctor Samuel M. Frank has much the same idea. In his article, "Sit, Rinse, Go Home," he criticizes the dentist who permits greed to overshadow ethics in his practice. He admits that the group of practitioners who violate ethics is a minority, but regrets that it is a *large* minority.

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The New York Journal of Dentistry: ". . . Ryan blames the mechanistic preconceptions of dental operations held by the dentist for the exhibitions of fear shown by his patients. He calls for a better understanding of 'the man within the patient' so that *rapport* may be established between the patient and the dentist and the fear reactions minimized."

Illinois Dental Journal: "All in all, I consider this book to be one of distinction and clarity, and the author has provided us a factual background for intelligent thinking on a very timely subject. The book is recommended most heartily."

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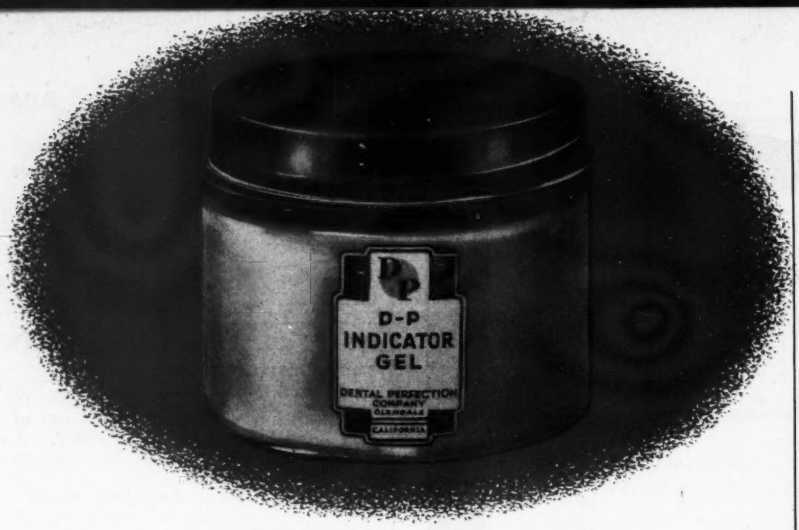

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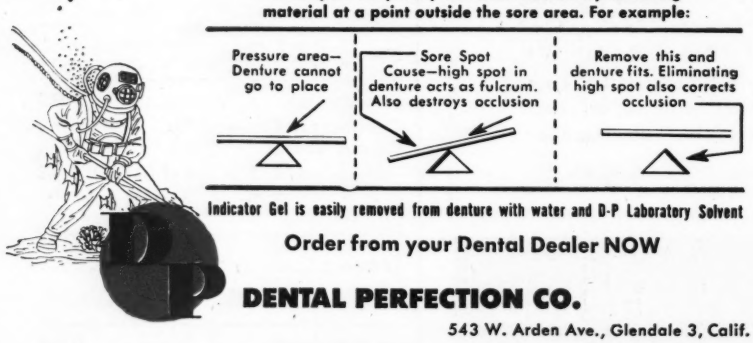

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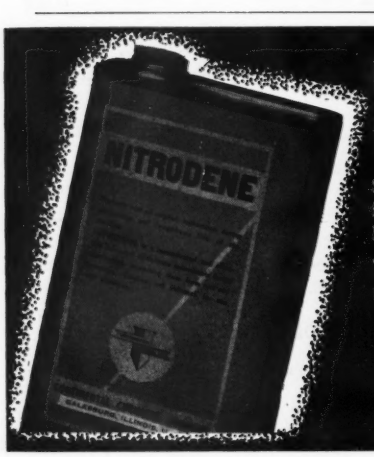

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